PB87-199550

ROD (Record of Decision) Annual Report, FY 1986

(U.S.) Booz-Allen and Hamilton, Inc.
Bethesda, MD

Prepared for

Environmental Protection Agency, Washington, DC

Jan 87

U.S. Department of Commerce
National Technical Information Service
NTIS

PB87-199550

ROD ANNUAL REPORT

FY 1986

EPA

JANUARY 1987

HAZARDOUS SITE CONTROL DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

031257

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

BIBLIOGRAPHIC INFORMATION

PB87-199550

ROD (Record of Decision) Annual Report, FY 1986.

Jan 87

PERFORMER: Booz-Allen and Hamilton, Inc., Bethesda, MD.
Contract EPA-68-01-7376

SPONSOR: Environmental Protection Agency, Washington, DC.

Sponsored by Environmental Protection Agency, Washington, DC.

The FY86 ROD Annual Report is designed to provide the Regions and Headquarters with summary data on FY86 RODs, and consists of the following sections: Introduction - highlights specific accomplishments in the ROD process. ROD Summaries - describes site conditions and key contaminants, selected remedial actions, specific remedy performance standards and goals, and institutional controls for each FY86 ROD. FY86 ROD Summary Table - summarizes all remedial actions, capital and operation and maintenance costs, contaminated media, and operable unit. Index of Approved Remedial Actions - summarizes selected remedial actions and future operable units for FY82-85 RODs and Enforcement Decision Documents (EDDs). ROD keyword list - provides major key word categories and their subcategories for all RODs approved to date.

KEYWORDS: *Waste disposal, *ROD reports, *Record of Decision, *Superfund, *Remedial action, *Pollution control.

Available from the National Technical Information Service, SPRINGFIELD, VA. 22161

PRICE CODE: PC A09/MF A01

Full Text RODs are available to the public through the National Technical Information Service (NTIS) and the Environmental Law Institute (ELI). Full text RODs also are distributed to each EPA Region and numerous government agencies and contractors.

This document was prepared by Booz, Allen & Hamilton, Inc.
under Delivery Order B16 of EPA Contract No. 68-01-7376.
Preparation of this document was for the Site Policy and Guidance Branch
of the Hazardous Site Control Division.

FY 1986 RECORD OF DECISION
ANNUAL REPORT

INTRODUCTION

The 1986 fiscal year concluded with a total of 84 approved Record of Decision (ROD) documents. This achievement marked an increase over last year's total of 68 RODs. Exhibit 1 (located at the end of the Introduction) outlines the steady increase in ROD approvals since the beginning of the Superfund program. Delegation of ROD approval authority to the Regional Administrators once again played an important role in the remedy selection process, as 98% of all FY86 RODs were approved in the Regions.

Fiscal year 1986 was year of transition for the ROD process. Revisions to the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) in November 1985 called for the consideration of treatment technologies that destroy or detoxify hazardous substances for permanent reduction of risk. In implementing the NCP and looking ahead to pending Superfund reauthorization, the program selected treatment technologies as a component of source control remedies 18% over FY85. Of the 60 source control RODs signed in FY86, 27 selected treatment technologies. Incineration was selected for 12 sites. Various chemical and physical treatment technologies such as volatilization/soil aeration, solidification, soil washing/flushing, and biodegradation also were selected to address source control problems at the remaining 15 sites. Exhibit 1 (which follows the introduction) lists the 27 RODs for FY86 and the selected treatment technologies that are components of source control remedial actions. In addition, those RODs approved between FY82-85 that selected treatment technologies are listed on Exhibit 2.

These remedy selections were made with the intent of being consistent with the provisions of the Superfund Amendments and Reauthorization Act (SARA) which were enacted October 17, 1986. The amendments state a preference for remedies that reduce the toxicity, mobility or volume of hazardous wastes and the mandate to utilize permanent solutions to the maximum extent practicable. The new statute also requires remdial actions to attain the applicable or relevant and appropriate requirements (ARARs) of other Federal and more stringent State environmental laws. The FY86 RODs were designed to comply with Federal ARARs, since the program had already done this by policy to the passage of SARA.

The FY86 ROD Annual Report is designed to provide the Regions and Headquarters with summary data on FY86 RODs, and consists of the following sections:

- _Introduction_ - highlights specific accomplishments in the ROD process.
- _ROD Summaries_ - describes site conditions and key contaminants, selected remedial actions, specific remedy performance standards and goals, and institutional controls for each FY86 ROD.
- _FY86 ROD Summary Table_ - summarizes all remedial actions, capital and operation and maintenance costs, contaminated media, and operable unit.
- _Index of Approved Remedial Actions_ - summarizes selected remedial actions and future operable units for FY82-85 RODs and other approved decision documents.
- _ROD Keyword List_ - provides major key word categories and their subcategories for all RODs approved to date.

This reference document, which captures the decisions made for all approved RODs, will enhance FY87 efforts to revise the ROD Guidance and prepare RODs in conformance with the new SARA and NCP provisions.

FY 1986 ROD ANNUAL REPORT
TABLE OF CONTENTS

SECTIONS		PAGES
I.	Introduction	1-5
II.	Records of Decision Abstracts	1-100
III.	Records of Decision Summary Table	1-15
IV.	Index of Approved Remedial Actions: FY 1982-1985	1-22
V.	Records of Decision Key Word List: FY 1982-1986	1-29

SECTION I

INTRODUCTION

Exhibit 1

Summary of FY 1986 ROD Sites Selecting Treatment Technologies as Components of Source Control Remedies

TECHNOLOGY	REGION	SITE NAME, STATE
Incineration (12)[1,2]	I	Baird & McGuire, MA
	II	Hyde Park, NY
	III	Drake, PA
		Westline, PA
	IV	Coleman Evans, FL
		Mowbray Engineering, AL
	V	Arrowhead Refinery, MN
		Fields Brook, OH
		LaSalle Electric, IL
		Metamora Landfill, MI
		Spiegelberg Landfill, MI
	VI	Sikes Disposal Pit, TX
Solidification (7)[1,2]	IV	Mowbray Engineering, AL
		Pepper's Steel, FL
		Sapp Battery, FL
	V	Burrows Sanitation, MI
		Fields Brook, OH
		Forest Waste, MI
	X	Queen City Farms, WA
Volatilization/Soil Aeration (4)[3]	I	Tinkham Garage, NH
	II	Caldwell Trucking, NJ
		Metaltec/Aerosystems, NJ
	IV	Hollingsworth Solderless, FL
Stabilization/Neutralization (3)[4]	II	Marathon Battery, NY
	III	Bruin Lagoon, PA
	VIII	Denver Radium/ROBCO, CO
Soil Washing/Flushing (2)[3]	I	Tinkham Garage, NH
	X	United Chrome, OR
Biodegradation (2)	III	Leetown Pesticide, WV
	V	Burlington Northern, MN
Land Application/Composting (1)[3]	I	Tinkham Garage, NH

---

[1] Includes Mowbray Engineering, AL, which will select either incineration or solidification

[2] Includes Fields Brook, OH, which selected both incineration and solidification

[3] Includes Tinkham Garage, NH, which will select either soil washing, aeration or composting

[4] Includes Denver Radium/ROBCO, CO, which may select stabilization

Exhibit 2

Treatment Technologies Selected at FY82-85 ROD Sites

Fiscal Year of ROD Signature	Technology	Region	Site Name, State
FY82	Stabilization/Neutralization	III	Bruin Lagoon, PA
FY83	—		—
FY84	Offsite Incineration	V	Berlin & Farro, MI
			Laskin/Poplar, OH
		X	Western Processing, WA
	Biodegradation	VI	Old Inger, LA
	Stabilization/Neutralization	VI	Bioecology, TX
FY85	Offsite Incineration	II	Bog Creek Farm, NJ
			Swope Oil, NJ
		VI	MOTCO, TX
			Triangle Chemical, TX
		VIII	Woodbury Chemical, CO
	Onsite Incineration	II	Bridgeport, NJ
		V	Acme Solvents, IL
	Soil Washing/Flushing	II	Goose Farm, NJ
		X	South Tacoma/Well 12-A, WA
	Stabilization/Neutralization	II	Wide Beach, NY
		IV	Davie Landfill, FL
	Biodegradation	V	Byron/Johnson Salvage, IL
	Volatilization/Soil Aeration	I	McKin, ME
		V	Verona Well Field, MI
		VI	Triangle Chemical, TX

Exhibit 3

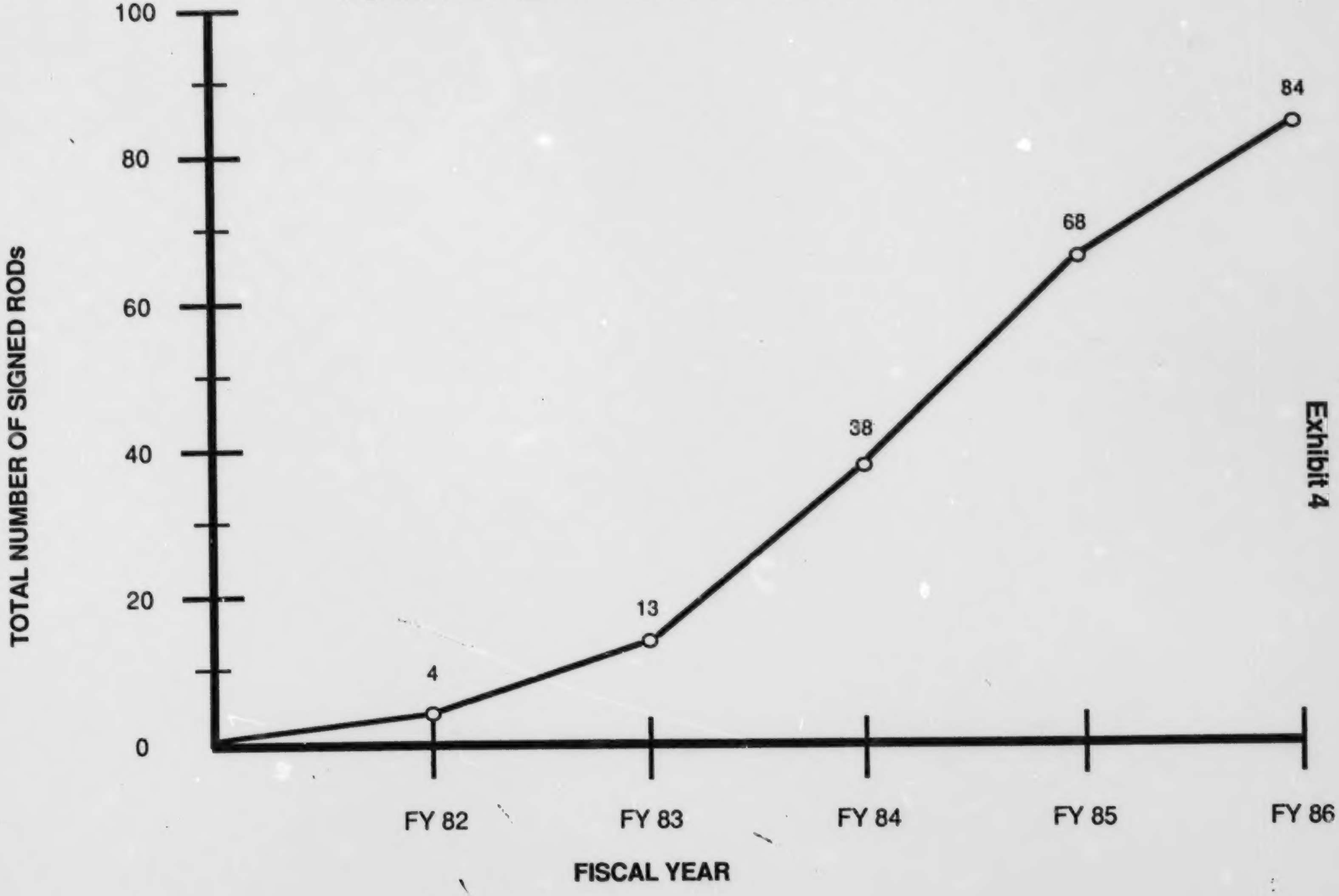
FY86 RECORD OF DECISION REMEDY SELECTION

Analysis	Region	I	II	III	IV	V	VI	VII	VIII	IX	X	TOTAL	% of TOTAL
Total Number of RODs		6	15	15	13	16	6	2	7	1	3	84*	
Total # of RODs addressing Final Remedy		2	7	7	13	6	3	1	2	0	2	43	51
# of RODs selecting No Action Alternative		0	0	2	0	0	1	0	0	0	1	4	5
# of RODs selecting Offsite Disposal of Untreated Wastes		0	3	5	4	2	1	1	1	0	1	18	21
# of RODs selecting Alternate Water Supply		2	4	3	1	4	2	0	3	0	0	19	23
# of RODs with Permanent or Temporary Relocation of Residents		0	0	0	1	0	1	0	0	0	0	2	2
# of RODs addressing Contaminated Ground Water		4	9	4	7	5	1	1	1	0	1	33	39
# of RODs using Capping, Onsite Landfilling, Containment, Disposal of Wastes without Treatment		2	5	7	4	2	2	1	4	1	0	28	33

* Includes Iron Mountain Mine, CA; ROD signed 10/3/86
Individual RODs may qualify for multiple analyses

Exhibit 4

NUMBER OF SIGNED RODs PER FISCAL YEAR *



* Includes Action Memos, Enforcement Decision Documents, and Negotiation Decision Documents

SECTION II

RECORDS OF DECISION ABSTRACTS

Each ROD and EDD summary presented in this section consists of the following:

- ROD Abstract - summarizing site location and background information, contaminated media, key contaminants, selected remedial action, and capital and O&M costs.
- Performance Standards or Goals - describing qualitative/quantitative cleanup criteria.
- Institutional Controls - describing site ordered restrictions.
- Key Words - highlighting alternative technologies, contaminated media, key contaminants, and major key word categories for the RODs. A list of RODs by key words is presented in the last section of this document.

RECORDS OF DECISION ABSTRACTS
FY 1986

TABLE OF CONTENTS

SITE NAME/STATE PAGE

**REGION

Auburn Road, NH 1
Baird & McGuire, MA 2
Industri-plex, MA 3
Kellogg-Deering Well Field, CT 5
Tinkham Garage, NH 6
Winthrop Landfill, ME 8

** REGION II

Brewster Well Field, NY 10
Caldwell Trucking, NJ 11
Combe Fill North Landfill, NJ 13
Combe Fill South Landfill, NJ 14
Florence Landfill, NJ 15
Hyde Park, NY 16
Kentucky Avenue Well Field, NY 17
Lang Property, NJ 18
Marathon Battery, NY 19
Metaltec/Aerosystems, NJ 20
Price Landfill, NJ 21
Rockaway Borough Well Field, NJ 23
Sharkey Landfill, NJ 24
Syncon Resins, NJ 25
Vestal Water Supply Well 1-1, NY 26

**REGION III

Army Creek Landfill, DE 27
Blosenski Landfill, PA 28
Bruin Lagoon, PA, 29
Chisman Creek, VA 30
Delaware City PVC, DE 31
Drake Chemical, PA 33
Industrial Lane, PA 34
Lansdowne Radiation, PA 35
Leetown Pesticide, WV 37
Limestone Road, MD 38
Middletown Road, MD 40
Millcreek, PA 41
Taylor Borough, PA 43
Tybouts Corner Landfill, DE 44
Westline Site, PA 46

TABLE OF CONTENTS (Continued)
Page Two

SITE NAME/STATE	PAGE
**REGION IV	
A.L. Taylor, KY	48
Coleman Evans, FL	49
Distler Brickyard, KY	50
Distler Farm, KY	51
Gallaway Ponds, TN	53
Hipps Road Landfill, FL	54
Hollingsworth, FL	56
Lees Lane Landfill, KY	57
Mowbray Engineering, AL	58
Pepper's Steel, FL	59
Pioneer Sand, FL	60
SCRDI Dixiana, SC	61
Sapp Battery, FL	62
**REGION V	
A & F Materials, IL	63
Arcanum Iron and Metal, OH	64
Arrowhead Refinery, MN	65
Burlington Northern, MN	66
Burrows Sanitation Site, MI	68
Byron Johnson Salvage Yard, IL	69
Fields Brook, OH	70
Forest Waste, MI	71
Lake Sandy Jo, IN	72
LaSalle Electrical, IL	73
Metamora Landfill, MI	74
New Brighton/Arden Hills/St. Anthony, MN	75
Novaco Industries, MI	76
Reilly Tar & Chemical, MN	77
Seymour, IN	78
Spiegelberg Landfill, MI	79
**REGION VI	
Cecil Lindsey, AR	80
Geneva Industries, TX	81
Odessa Chromium I, TX	82
Odessa Chromium II, TX	83
Sikes Disposal Pits, TX	84
United Creosoting Site, TX	85

TABLE OF CONTENTS (Continued)
Page 3

SITE NAME/STATE PAGE

**REGION VII
Des Moines TCE, IA 87
Ellisville Site Area, MO 88

**REGION VIII
Denver Radium/ROBCO, CO 90
Denver Radium Site Streets, CO 91
Libby Ground Water, MT 92
Marshall Landfill, CO 93
North Dakota Arsenic Trioxide, ND 94
Smuggler Mountain, CO 95
Union Pacific Railroad, WY 96

**REGION IX
Iron Mountain Mine, CA 97

**REGION X
Queen City Farms, WA 98
Toftdahl Drums, WA 99
United Chrome, OR 100

AUBURN ROAD, NH
First Remedial Action
September 17, 1986

ROD ABSTRACT:

The Auburn Road Landfill site, located in the Town of Londonderry, New Hampshire, consists of approximately 200 acres which contain four documented hazardous waste disposal areas. Prior to the 1960s, activities at the site consisted of sand and gravel excavation. Between 1964 and 1974, the New Hampshire Division of Public Health issued permits to the Town of Londonderry to operate separate sections of the Thomopoulus property as disposal sites currently referred to as the Town Dump, the Tire Dump, the Septage Lagoon, and the Solid Waste Landfill. Although authorized for disposal of only municipal refuse, tires and demolition debris, all four source areas contain evidence of disposal of industrial wastes including numerous exposed and partially buried 55-gallon steel drums. In August 1979 the State of New Hampshire specifically prohibited the disposal of drums, and later the same year, the New Hampshire Water Supply and Pollution Control Commission found VOC contamination of surface water and ground water. In January 1980, landfill operations were terminated on the entire site. Ground water, used as a drinking water source for approximately 275 homes and 260 mobile homes - all within a one-mile radius of the site, is the principal medium of concern. The primary contaminants of concern include: VOCs including TCE, extractable organics, heavy metals, and inorganics.

The selected interim remedial action consists of extending the current water service provided by the Manchester Water Works to 17 homes along Auburn Road and to approximately 260 mobile home units in the Whispering Pines Mobile Home Village. Further remedial actions will address source control and further management of migration alternatives. The estimated present worth cost for this remedy is $2,372,000 with estimated annual O&M of $57,000.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Alternate Water Supply; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; O&M; Organics; Sediments; Soil; Surface Water; TCE; VOCs.

BAIRD & MCGUIRE, MA
First Remedial Action
September 30, 1986

ROD ABSTRACTS

The Baird & McGuire site encompasses approximately twenty acres in Holbrook, Norfolk County, MA. Wetlands occupy approximately 44 percent of the site with approximately 66 percent of the site lying within a 100-year flood plain. Baird & McGuire, Inc. (BMI) operated a chemical mixing and batching company from 1912 to 1983. Between 1954 and 1977 the company was fined at least 35 times by the EPA for numerous violations. Consultants to the Town of Holbrook reported that BMI's disposal practices from 1959 to 1962 were the source of ground water and wetlands contamination. In February 1982 a citizen's complaint of an oily substance on the Cochato River initiated a site inspection which reported surface water, ground water, and wetlands contamination. In March 1983 heavy rains caused a breach of the creosote collection lagoon resulting in an EPA-initiated Immediate Removal Action. This action included: the removal of approximately 1,000 cubic yards of contaminated soils, construction of a clay cap, installation of a ground water interception/recirculation system, and erection of limited fencing. In May 1983, Holbrook revoked BMI's permit to store chemicals and ordered it to dismantle the existing storage facilities. In June 1985, EPA announced initial remedial measures which included building demolition, tank farm demolition and removal, removal and disposal of underground tanks, relocation of the twelve inch municipal water main and construction of temporary capping. Dioxin, detected in surficial soil samples in July 1985, prompted an EPA-initiated second removal response involving the installation of 5700 feet of fencing and extensive soil, ground water, surface water, and air sampling. The primary contaminants of concern include: VOCs, organics, PAHs, dioxin, pesticides, and metals.

The selected remedial action includes: excavation in "hot areas" to remove approximately 191,000 cubic yards of contaminated soils; onsite incineration of excavated soils; ground water extraction and onsite treatment with discharge to an onsite aquifer; restoration of wetlands at excavated areas; construction of levees; relocation of the Unnamed Brook; ground water monitoring; and air quality monitoring. The estimated capital costs are $44,386,000 with 30-year O&M costs of $4,132,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards/goals not outlined in the ROD.

KEY WORDS: Alternative Technology; Dioxin; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Flood Plain; Incineration; Levees; Heavy Metals; O&M; Organics; PAHs; Pesticides; Soils; VOCs; Wetlands.

INDUSTRI-PLEX, MA
First Remedial Action
September 30, 1986

The Industri-plex site is a 245-acre industrial park located in Woburn, Massachusetts. Various manufacturing facilities operated on the site from 1853 to 1968. During these years the site has supported manufacturers of sulfuric acid (and related chemicals), animal hide glue, arsenic insecticides, acetic acid, dry colors and munitions; and producers of organic chemicals including phenol, benzene and toluenes. Prior to 1934, waste materials appear to have been randomly disposed of over a wide area. The wastes were used to fill lowlands, wetlands and shallow ponds, and as construction material to build dikes and levees to contain liquid wastes. After 1934 wastes were deposited directly on top of the existing deposits and reached heights in excess of forty feet above natural grade. The presence of hazardous substances was detected in 1979 when the current owner of the site, Mark Phillip Trust, began developing portions of the site. As site development began to encroach on the buried animal glue manufacturing wastes, a very strong and pervasive "rotten egg" odor was released. Despite repeated citizen complaints and notices of violations issued by the MDQE, the Trust continued its development of the site. Portions of stockpiled wastes sloughed off, releasing hydrogen sulfide gases to the atmosphere and toxic metals and soils to the pond and wetlands. Large areas of the contaminated soils are exposed at the surface thereby allowing individuals and animals to come in direct contact with arsenic, chromium and lead. Other contaminants of concern include benzene and toluene.

The selected remedial alternative for this site includes the following actions. For approximately 1,000 cubic yards of contaminated soils and sludges: site grading; installation of a permeable soil cover cap over certain areas; implementation of institutional controls; water quality monitoring; and post closure maintenance consistent with RCRA regulations. For ground water: an interim remedy of pumping "hot spot" areas and ground water treatment to control odors; development of a multi-service ground water response plan to address the aquifer; air stripping to remove VOCs and discharge to the upgradient portion of the aquifer; and ground water monitoring. For air: stabilization of the side slopes of the East and West Hide Piles; installation of a gas collection layer; installation of a synthetic membrane cap to establish impermeability; treatment of gaseous emissions with either activated carbon or thermal oxidation with the final treatment selection to be decided after the impermeable cover has been installed; implementation of air quality monitoring program; and routine maintenance. The estimated capital cost for the entire remedial action is $12,302,300, or $12,612,000 depending on air treatment with annual O&M of $285,500, or $311,000 depending on air treatment.

INDUSTRI-PLEX, MA
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Soils: eliminate direct contact threat of soils with arsenic > 300 ppm; lead > 600 ppm; chromium > 1000 ppm. Ground water: treatment to MCLs to attain SDWA standards. Air: remedy to achieve NAAQS and unit cancer risk levels.

INSTITUTIONAL COST: Possible modification of the City of Woburn's zoning regulations and use of State authority to further assist in the control and future use of the affected properties.

KEY WORDS: Air Emissions; Air Stripping; Arsenic; Chromium; Direct Contact; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; O&M; PRP; RCRA Part 264; Soils; Sludge; Toluene; VOCs; Wetlands.

KELLOGG-DEERING WELL FIELD, CT
First Remedial Action
September 25, 1986

ROD ABSTRACT:

The Kellogg-Deering Well Field site, also known as the Smith Well Field, is a 10-acre public supply well field in southwestern Fairfield County, along the western bank of the Norwalk River, Norwalk, CT. The well field is owned and operated by the Norwalk First Taxing District Water Department (NFTD) serving approximately 45,000 people. The primary source of public water supply to the NFTD is surface water from four reservoirs, with ground water as a secondary source. In 1975, trichoroethene (TCE) was discovered in the ground water. Between 1975 and 1980 the Connecticut Department of Environmental Protection performed onsite sampling and initiated investigations at several local industries to locate potential source areas. In June 1986, the EPA completed a remedial investigation which identified various potential source areas. The potential primary source of ground water contamination seems to be located at the eastern edge of the study area. Contaminants are migrating with the ground water from areas of high concentration toward the well field. The movement is partially influenced by the pumping of the production wells. TCE is the primary contaminant of concern. Other identified contaminants include: PCE, 1-2-DCE, methylene chloride, xylenes, and benzene.

The selected remedial action for this site includes: the operation of an existing air stripping facility as well as the associated monitoring requirements. Ground water treated by the air stripper will be subsequently discharged into the existing conventional water treatment plant and distribution system. Further remedial actions will address ground water source control. The estimated capital cost associated with this remedy is $69,751 with annual O&M costs of $52,836.

PERFORMANCE STANDARDS OR GOALS: Ground water treatment will achieve a 99 percent TCE removal efficiency which corresponds to a 10^{-6} excess cancer risk.

KEYWORDS: Air Stripping; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; TCE; VOCs.

TINKHAM GARAGE, NH
First Remedial Action - Final
September 30, 1986

ROD ABSTRACT

The Tinkham Garage site encompasses 375 acres of residential and undeveloped land in Londonderry, NH. Approximately 400 people reside within a condominium complex on the western boundary of the site. Additional housing includes private, one-family homes within site boundaries to the north. An unnamed tributary and an attached intermittent stream branch through the condominium complex and discharge into Beaver Brook, which discharges to the Merrimack River further south. The 100-year flood plain forms an approximately 2-acre wetland at the tributary's confluence with Beaver Brook. The flood plain widens considerably south of the complex forming a 66-acre wetland. In addition, a 57-acre wetland exists to the southeast of the site. Some residents within the site continue to use the bedrock aquifer for drinking water purposes. Ground water in the bedrock discharges to the tributary via surface and ground migration. Between 1978 and 1979, waste disposal activities behind Tinkham garage included the direct surface dumping of liquids and sludge from tank truck washings. In April 1978 citizen complaints of foam and odors in a small unnamed brook resulted in a site cleanup and the excavation of a diversion trench to direct surface run-off. The RI, completed in January 1986, documented contamination from volatile and extractable organic compounds associated with ground water in overburden and bedrock aquifers, surface water and in soil located in the field behind Tinkham garage and in the condominium complex. Specifically, contaminated soil within the complex was associated with the individual domestic waste leaching fields for a number of buildings within the complex. Two other source areas existed within the complex: a refuse area for disposal of soils excavated from the leach fields; and a low lying contaminated swale area in close proximity to the unnamed tributary. The swale is suspected to be another site of direct discharge of liquid wastes to the ground surface. The primary contaminants of concern include: VOCs, organic sludges and metals.

The selected remedial action includes: excavation of approximately 10,800 cubic yards of contaminated soils behind Tinkham garage; field work and analytical modeling to determine the need for the removal of additional, potentially contaminated soils in the condominium complex; onsite treatment of all excavated contaminated soils by either aeration, composting or soil washing; regrading and revegetation of excavated source areas after treated soils have been returned to their original locations; reconstruction of any removed leach fields; restoration of wetlands where contaminated soils are excavated; extraction and offsite treatment of contaminated groundwater at Derry, NH publicly owned waste water treatment works, which may lead to offsite pretreatment; and ground water monitoring on- and offsite. The estimated capital cost is $2,058,000 with annual O&M of $874,000.

PERFORMANCE STANDARDS OR GOALS: PCE and TCE concentrations in both soil source areas and in ground water will be used as indicator compounds for remediation. Remediation will be evaluated in terms of the underlying assumption that treatment to target levels will result in non-hazardous levels of other contaminants. At a minimum, soil will be treated to 1ppm of total volatile organic compounds.

KEYWORDS: Alternative Technology; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; Metals; O&M; Onsite Disposal; Organics; PCBs; POTW; Sediments; Sludge; Soils; Surface Water; TCE; VOCs; Wetlands; Wood.

WINTHROP LANDFILL, ME (EDD)
First Remedial Action - Final
November 22, 1985

ROD ABSTRACT

The Winthrop Landfill consists of two contiguous parcels totalling approximately 13 acres, located along the western shore of Annabessacook Lake in the Town of Winthrop, Maine. The site was initially used in the 1920s as a sand and gravel pit. In the 1930s, parts of the site became the Winthrop Town Dump, accepting mixed municipal, commercial, and industrial wastes. The site received hazardous substances between the early 1950s and mid-1970s. It is estimated that more than 3 million gallons of chemical wastes, mostly complex organic compounds including resins, plasticizers, solvents, and other process chemicals, were disposed at the site. Wastes were openly burned until 1972, and landfilling occurred from 1972 until 1982.

The selected remedial action for this site includes: the extension of an alternate water supply to residences in close proximity to the landfill; construction of a chain link fence around the landfill, and imposition of deed restrictions prohibiting use of the landfill for activities other than the remedial action; prohibition of ground water withdrawals for purposes other than remedial action; prohibition of excavation in the area of the landfill, except for residential construction or remedial action; quarterly sampling of monitoring points in sensitive areas; grading and placement of a RCRA cap over the entire landfill; completion of engineering design work (geologic, hydrogeologic, and treatability pilot studies); and establishment of an Alternate Concentration Limit (ACL) for each contaminant in the ground water based on RCRA Section 264.94(b) criteria. If the ACL is exceeded, installation and operation of an interceptor system and construction and operation of a water treatment facility northeast of the landfill will be implemented. Total capital cost for the selected remedial alternative is estimated to be $6,000,000. Operation and maintenance for the recommended alternative is estimated at $42,000 per year if the ACL is not exceeded. Should the ACL be exceeded, O&M of the ground water extraction and treatment system, along with monitoring and cap maintenance, will cost between $360,000 and $1,480,000 per year, depending upon the method used to treat the contaminants. Under the terms of the Consent Decree, Inmont Corporation and the Town of Winthrop will provide funding for design, construction, and O&M at the site.

PERFORMANCE STANDARDS OR GOALS: Establish an Alternate Concentration Limit (ACL) for each contaminant in the ground water based on RCRA Section 264.94(b) criteria. If an ACL is not established, then the ground water protection standard will be the background level of each contaminant in the ground water.

INSTITUTIONAL CONTROLS: Imposition of deed restrictions prohibiting use of the landfill for activities other than the remedial action. Prohibition of ground water withdrawals for purposes other than remedial action. Prohibition of excavation, except for residential construction or remedial action.

WINTHROP LANDFILL, ME (EDD)
First Remedial Action - Final
(Continued)

KEYWORDS: ACL; Alternate Water Supply; Capping; Consent Decree; Deed Restriction; Direct Contact; Discharge Standards; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; Municipally Owned Site; O&M; Organics; RCRA Closure Requirements; RCRA Part 264; Solvents; Toluene; Treatability Studies.

BREWSTER WELL FIELD, NY
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Brewster Well Field, located on the northern bank of the East Branch Croton River, is three-quarters of a mile east of the Village of Brewster, Town of Southeast, Putnam County, NY. The land to the north and west, containing the community of Brewster Hill and the Village of Brewster respectively, is largely residential, while most of the land south of the site area is occupied by commercial or light industrial facilities. Since 1954 when Well Field No. 1 was developed, the Village of Brewster has used the aquifers beneath the Village-owned land as a water supply source. In 1967 Well Field No. 2 was brought on line. The two well fields consist of a total of 18 shallow wells. In 1978 evidence of volatile halogenated organic compound contamination from an unidentified source first appeared. Five alternative water sources were subsequently added to the water supply system. Prior to drought conditions arising in 1981, East Branch Croton River surface water was also used at times to supplement the water supply system. Since 1979, the Village of Brewster has conducted studies to identify potential alternative ground water sources and to test spray aeration as a potential treatment method for VHO removal. In 1984 under a Cooperative Agreement with the EPA Office of Research and Development, the Village installed a fullscale packed column for treatment of the entire Village supply. It has been concluded that treatment of existing sources is the most promising of the alternatives for solving existing contamination problems, and based on trends, it is believed that the Well Field has reached a steady state condition, whereby contaminant levels are not expected to increase at the Well Field in the future. VHOs have been the primary contaminants detected in the ground water. The principle contaminants were found to be tetrachloroethylene, trichloroethylene, and 1,2-dichloroethylene.

The selected remedial action includes: continued operation of the existing air stripper to treat the water supply; and design and construction of a ground water management system which will include ground water extraction wells, air stripper treatment of extracted ground water and reinjection of treated water. Details of the ground water management system will be determined during design. The estimated capital cost for this remedial action is $163,912 with annual O&M of $27,468.

PERFORMANCE STANDARDS OR GOALS: Remedy will exceed both ARAR's MCL standards for TCE (5 ug/l.) and State ground water standards (10 ug/l.)

KEYWORDS: Air Stripping; Drinking Water Contaminants; Ground Water; Ground Water Management System; Ground Water Treatment; O&M; PCE; Soil; State Criteria; Surface Water; TCE; VOCs.

CALDWELL TRUCKING, NJ
First Remedial Action
September 25, 1986

ROD ABSTRACT

The Caldwell Trucking Company site is a 12.2-acre property in Fairfield Township, Essex County, NJ which is bordered by light industry to the north, west, and southwest and is directly across from the Essex County Airport property. Approximately 45 small businesses are situated within one mile of the site. The nearest major residential area is about 1,000 feet northeast of the site. The Passaic River is located about 4,000 feet northeast and is used as a public water supply. Numerous residential wells north of the site are no longer in use and most of the residents now use municipal water. The Caldwell Trucking Company was incorporated by the State of NJ in 1946 for the purpose of cleaning residential septic tanks. For a number of years, Caldwell emptied septic systems and transported the waste to an old slaughter house property (now part of the Caldwell site) for disposal in one of the open, unlined lagoons present on site. Based on information supplied by Caldwell in 1973, wastes would be treated with a disinfectant such as sodium hypochlorite and allowed to settle. Later, the "clarified" liquid layer would be pumped out and transported by tank truck to a large seepage lagoon where the liquid would percolate quickly through the sandy soil. In the mid-1950s light industry, developing in the area, may have discharged hazardous substances into their septic systems to be subsequently pumped out and deposited on the Caldwell property. There were also other trucking companies who brought septic substances to the site, which may have been mixed with hazardous wastes. There are also indications that spent solvents and other industrial liquid wastes were disposed of in onsite lagoons. In 1972 seepage and odors from the site revealed that Caldwell was disposing of septic waste in this manner without the necessary permits. They were licensed to transport waste but were not an approved disposal facility. A 1973 application to operate as a sanitary landfill was denied by the NJDEP. Subsequently, Caldwell backfilled all lagoons except one, which was covered with plywood. At the start of the RI in 1984, the Caldwell property showed almost no visible signs of a septic waste disposal facility. The source of contamination, which had been deposited in unlined lagoons, had been backfilled 12 years earlier. The primary contaminants of concern include: VOCs, TCE, PCBs, PAHs, inorganics, and lead.

The selected remedial action includes: excavation and treatment, via heat addition, of approximately 28,000 cubic yards of contaminated soils and waste materials; disposal of treated soils in a secure landfill to be constructed at the site in accordance with RCRA requirements; restoration of a last potable water resource by providing treatment, via air stripping, of municipal public water supply well number 7; provision of an alternate water supply for residents potentially affected by ground water contamination from the site; and preparation of a supplemental RI/FS to identify the extent and other sources of ground water contamination, and to develop and evaluate appropriate remedial alternatives. The estimated capital cost for this remedial action is $5,490,000 with annual O&M costs of $48,000.

CALDWELL TRUCKING, NJ
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Specific performance standards not outlined in the ROD.

KEYWORDS: Air Stripping; Alternate Water Supply; Alternative Technology; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Inorganics; Lead; O&M; Onsite Disposal; PAHs; PCBs; PCE; RCRA Landfill Requirements; Sediments; Soil; Surface Water; TCE; VOCs.

COMBE FILL NORTH LANDFILL, NJ
First Remedial Action - Final
September 29, 1986

ROD ABSTRACT

The Combe Fill North site is located in Mount Olive Township, NJ, near the intersection of U.S. Highway 206 and Interstate 80. The former landfill comprises 65 acres of the 103-acre property. The area surrounding the site is primarily wooded, with small residential areas, farms and light industry nearby. Approximately 10,000 people rely on ground water supplied from wells downgradient of the site. Between 1966 and 1978, the site operated as a sanitary municipal landfill, accepting municipal, vegetative, and non-chemical industrial wastes, along with small amounts of dry sewage sludge. From September 1978 until January 1981, the landfill was owned and operated by the Combe Fill Corporation (CFC). During this time, CFC was repeatedly cited for violations of New Jersey solid waste administration codes. In 1979, public outrage at the disposal practices of CFC led to formation of SMOTHER (Save Mount Olive Township-Halt Environmental Rape), a public action group which conducted ground water sampling and initiated procedures to include the Combe Fill North site on the NPL. During the RI, ground water, soils, leachate, sediments and surface water were sampled. Low levels of volatile organics were found in soils and leachate, and hexachlorobenzene, phenol and bis (2-ethylhexyl) phthalate were detected in low concentrations in ground water samples.

The selected remedial action for the Combe Fill North site includes: grading and compacting the 65-acre waste disposal area; capping the landfill in accordance with appropriate solid waste management criteria; installation of a drainage system, including perimeter ditches and corrugated metal pipes; installation of a methane ventilation system; fencing the entire site; and implementation of an appropriate monitoring program to ensure the effectiveness of the remedial action. Estimated capital cost for the remedy is $10,500,000 with annual O&M costs of $168,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards/goals not outlined in the ROD.

KEYWORDS: Capping; Ground Water; O&M; RCRA Closure Requirements; Soils, VOCs.

COMBE FILL SOUTH LANDFILL, NJ
First Remedial Action - Final
September 29, 1986

ROD ABSTRACT

The Combe Fill South Landfill site is located in Morris County, New Jersey, 20 miles west of Morristown. The site consists of a 115-acre parcel of land owned by the Combe Fill Corporation which contains three separate fill areas comprising 65 acres. Illegal waste disposal is suspected in two fields northwest and southeast of the site. The site is situated on a hill, causing runoff to drain almost radially from the site. Leachate, ground water and surface runoff constitute the headwaters of Trout Brook, which flows through Hacklebarney State Park. The brook is stocked with trout and is used for recreational purposes by park visitors. A large portion of nearby wetlands area was cleared to construct the landfill. The Combe Fill South Landfill was operated for 40 years as a municipal landfill, permitted to accept municipal and non-hazardous industrial wastes, sewage sludge, septic tank wastes, chemicals and waste oils. Testing indicated that the fill material consists mainly of highly decomposed rubbish, and that no "hot spots" or localized sources of hazardous substances exist. Cover at the site is extremely poor, leading to infiltration of leachate into underlying aquifers. The primary contaminants of concern are VOCs, including TCE, PCE, toluene, benzene and methylene chloride, which have contaminated the shallow and deep aquifers that are the primary source of potable water for local residents.

The selected remedial action for the Combe Fill South site includes: an alternate water supply for affected residences; capping of the 65-acre landfill in accordance with RCRA requirements; active gas collection and treatment system; pumping and onsite treatment of shallow ground water and leachate with discharge to Trout Brook; surface water controls to accommodate seasonal precipitation and storm runoff; site fencing; monitoring to ensure remedial action effectiveness; and a supplemental FS to evaluate the need for deep aquifer remediation. The estimated capital cost of the remedial action is $46,060,700 with annual O&M costs approximately $673,000 for the first 5 years.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards/goals not outlined in the ROD.

KEYWORDS: Air; Alternate Water Supply; Capping; Drinking Water Contaminants; Ground Water; Ground Water Treatment; Leachate Collection/Treatment; O&M; Organics; PCE; Sediments; Soil; Surface Water; TCE; Toluene; VOCs; Wetlands.

FLORENCE LANDFILL, NJ
First Remedial Action - Final
June 27, 1985

ROD ABSTRACT

The Florence Land Recontouring (FLR) Landfill is a 60-acre site located on Cedar Lane Extension in the Townships of Florence, Mansfield, and Springfield in Burlington County, New Jersey. The site consists of a 29-acre landfill, two lagoons, a pond and two tanks, and is located in a combined residential-agricultural area. The site is bounded by land purchased by Burlington County for a new 600-acre solid waste management facility and by Assiscunk Creek, a tributary to the Delaware River which is used for recreation and irrigation. The FLR landfill was operated as a solid waste disposal facility from late 1973 to late 1981 and was permitted to accept sanitary and non-chemical industrial wastes. In 1975, the New Jersey Department of Environmental Protection investigated chemical waste disposal at the site and disclosed that 95 tons of hazardous waste consisting of phthalates, heavy metals and vinyl chloride monomers had been illegally disposed at the site. Elevated levels of hazardous substances have been discovered in soils and ground water within the landfill.

The selected remedial alternative includes: construction of a synthetic membrane and clay composite cap, a circumferential soil/bentonite slurry containment wall, an upgradient ground water interceptor system and a new stormwater management system; leachate treatment and disposal at a POTW or the Burlington County Solid Waste Complex; gas collection and treatment; removal and disposal of lagoon liquids and sediments, and other surface debris; construction of a partial fence with warning signs; and supplemental sampling of ground water, surface water and sediments during design. The estimated capital cost for the selected remedy is $8,021,000 with annual O&M costs of $170,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance goals not outlined in the ROD.

KEYWORDS: Capping; Ground Water; Heavy Metals; O&M; POTW; Sludge; Soils.

HYDE PARK, NY (EDD)
First Remedial Action - Final
November 26, 1985

ROD ABSTRACT

The Hyde Park landfill, approximately 15 acres in area, is located in the northwest corner of the Town of Niagara, New York. It is immediately surrounded by several industrial facilities and property owned by the Power Authority for the State of New York (PASNY). Th Niagara River, an international waterbody, is located 2000 feet to the northwest. Between 1954 and 1975, Occidental Chemical Corporation (OCC) disposed of approximately 80,000 tons of chemical wastes at the landfill and 0.6 to 1.6 tons of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) contaminated material. Between 1975 and 1979, OCC, pursuant to directives from the State, implemented a number of remedial actions. These actions included capping the site, and installing a shallow tile drain and a ground water monitoring program. Soil and ground water are contaminated with VOCs, organics, toluene, phenol, PCBs and dioxin.

The selected remedy for this site includes: installation of a prototype purge well system to extract non-aqueous phase liquids (NAPL) for destruction by incineration; installation of an overburden tile drain system; implementation of engineering controls for an industrial protection program designed to eliminate exposure to nearby workers; installation of ground water wells as part of a residential community monitoring program; installation of the first stage of a bedrock NAPL Plume Containment System; installation of two to three purge wells as an aqueous phase liquid (APL) Plume Containment System; implemenation of a lower formation and deep formation study; implementation of a Niagara Gorge Seep program; treatment of ground water with activated carbon; and implementation of a monitoring program. The estimated present worth cost for this remedial alternative is $17,000,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards/goals not outlined in the ROD.

KEY WORDS: Consent Decree; Dioxin; Ground Water; Ground Water Monitoring; Ground Water Treatment; Incineration; O&M; Organics; PCBs; Phenols; Plume Management; Soil; Toluene; VOCs.

KENTUCKY AVENUE WELL FIELD, NY
First Remedial Action
September 30, 1986

ROD ABSTRACT

The Kentucky Avenue Well Field, part of the Elmira Water Board (EWB) public water supply system, covers approximately 12 square miles in the south central part of Chemung County, New York. The site is at the confluence of two major valleys within the Chemung River Basin and is bordered by Newton Creek on the eastern perimeter. The major part of the valley is primarily residential and commercial, with little or no agricultural usage. The Kentucky Avenue Well Field, part of the EWB network of wells and reservoirs serving area residents, was closed in September 1980 following the discovery of elevated levels of TCE. The Chemung River and the Newton Creek aquifer are the primary sources of drinking water. Results of continued ground water sampling conducted by the Chemung County Health Department, New York State Department of Health, New York Department of Environmental Conservation, and EPA, showed that the TCE was found throughout the Newton Creek aquifer. EPA initiated a removal action in March 1985 to provide alternate water supplies to impacted residences not connected with the public water distribution system. Between March 1985 and March 1986 a two-phase hookup connected 43 homes to the public water distribution system. Studies to identify current private well residences requiring public water distribution system hookup and plume migration investigations are continuing. The primary contaminants of concern include: TCE, VOCs, and chlorinated solvents.

The selected remedial action includes: investigation of all residences in the study area to identify private well use. Upon completion, all private well users will be connected to public water supplies; installation of monitoring wells upgradient of the Sullivan Street wells, with sampling at and upgradient of the wells to be performed on a quarterly basis; and preparation of a supplemental source control RI/FS to identify the source of contamination and to determine appropriate source control measures. The source control RI/FS will be a composite of both ongoing and proposed studies at various potential source sites within the study area. The estimated capital cost is $303,800 with annual O&M of $19,000.

PERFORMANCE STANDARDS OR GOALS: Appropriate standards include EPA's Maximum Contaminant Levels (MCL) proposed pursuant to the Safe Drinking Water Act. The applicable proposed MCL for TCE is 5ppb.

KEYWORDS: Alternate Water Supply; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; O&M; Solvents; TCE; VOCs.

LANG PROPERTY, NJ
First Remedial Action - Final
September 29, 1986

ROD ABSTRACT

The Lang Property site is a 40-acre parcel of land in a sparsely populated rural area of Pemberton Township, Burlington County, New Jersey. The site is flat and consists of an unpaved access road leading to a 4-acre clearing. Unauthorized disposal of hazardous wastes appears to have occurred over a 2-acre area within the clearing. Abandoned vehicles, tires and other debris are scattered throughout the site. The site is located within New Jersey's Pinelands National Reserve, a forest expanse nationally recognized as a valuable environmental resource, and is within the 100-year flood plain. In June 1975, 1200-1500 drums of unidentified chemical waste were discovered in a clearing at the end of the unpaved road. In 1976, Edward and Florence Lang, owners of the property, were ordered by the State to remove all drums and contaminated soil. Prior to removal, the contents of the drums were apparently spilled onto the ground or disposed of in what has been described as "onsite lagoons". The contents of the drums appear to be the source of contamination occurring at the site. The main contaminants of concern at the Lang Property are VOCs and metals, which have contaminated soils, sediments, ground water, and surface water on site.

The selected remedial action at the Lang site includes: excavation of approximately 6500 cubic yards of contaminated soils and waste material with offsite disposal at an approved landfill; extraction and onsite treatment of contaminated ground water with reinjection of treated water into the aquifer; restoration of the excavated area by filling and grading, including removal of surface debris as necessary; installation of a security fence; and monitoring to ensure remedy effectiveness. Estimated capital costs for the remedy are $2,322,000 with annual O&M costs of $612,000.

PERFORMANCE STANDARDS OR GOALS: Effluent from the onsite ground water treatment system will attain Safe Drinking Water Act criteria.

KEYWORDS: Air Stripping; Chromium; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; O&M; Offsite Disposal; RCRA Landfill Specifications; Soil; TCE; Toluene; VOCs.

MARATHON BATTERY, NY
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Marathon Battery Company (MBC) site, located in the Village of Cold Spring, Putnam County, NY, has two components: the East Foundry Cove Marsh (EFCM), and Constitution Marsh. The site began as a battery manufacturing plant in 1952, producing military and commercial batteries for a period of 27 years. During this time the site property changed ownership and its name several times. It operated as the MBC from 1969 to 1979. Approximately 50,000 kg of cadmium were discharged into the EFCM as a result of MBC's wastewater treatment system. A bypass valve, used during system overloads and shutdowns, diverted flow to EFCM. This occurred at least twice weekly for periods of time ranging from a few hours to a full operating shift. In 1965 the New York State Department of Health ordered the plant to disconnect its industrial discharge from the Village's sanitary sewer upon concluding that the battery plant's process effluent could not be managed by a new proposed sewage treatment system. Accommodating the directive, the plant shut down the diversion pumps and bypassed the entire wastewater flow into the storm sewer to EFCM. Between September 1972 and July 1973 hydraulic dredging of the channel, which connects EFCM to Constitution Marsh, removed approximately 90,000 square meters of sediment. Approximately 4,000 cubic meters of dredged material were then retained in a diked enclosure constructed over a parking lot on the battery facility property. During the dewatering process, the sediments were allowed to settle and the supernatant was passed through a storm drain and back into Foundry Cove. The primary contaminants of concern include: cadmium, cobalt, and nickel.

The selected remedial action for the EFCM component of the site includes: hydraulic dredging of approximately 23,000m^3 of sediments; sediment chemical fixation; offsite disposal of approximately 47,000m^3 of processed sediments; dredging, water treatment and disposal; marsh restoration; and long-term monitoring. The selected remedial action for Constitution Marsh includes: a no-action alternative with long term sediment and water monitoring; a public awareness program; and site access restrictions. The estimated capital cost for both remedial components is $16,640,000 with O&M costs of $3,530,000 for the first year; $180,000 for years 2-5; and $127,000 for years 6-30.

PERFORMANCE STANDARDS OR GOALS: Sediments will be treated to a 100mg/kg established background concentration. Standards for total cadmium water concentrations are $6.6 \times 10^{-4} - 2.0 \times 10^{-3}$ mg/l for water hardness levels of 50 and 200 mg/l respectively.

INSTITUTIONAL CONTROLS: Site access restrictions will include limitations on fishing and water sports, and the installation of fencing.

KEYWORDS: Alternative Technology; Dredging; Heavy Metals; Institutional Controls; O&M; Offsite Disposal; Stabilization; Surface Water.

METALTEC/AEROSYSTEMS, NJ
First Remedial Action
June 30, 1986

ROD ABSTRACT

The Metaltec/Aerosystems site is located at the intersection of Maple, Gibson, and Wildcat Roads in Franklin Borough, Sussex County, New Jersey. The property consists of an abandoned manufacturing facility that once produced metal ballpoint pen casings, paint spray guns, lipstick cases and other assorted metal parts. The site is presently used to assemble ice machines and the manufacture of glassware for research purposes. In its current state, the site contains several sources of hazardous substances that pose a threat to public health and the environment. These sources include a back filled lagoon area, two open areas which adjoin the Metaltec building, and an open parcel of land located near the swamp at the northeast corner of the site. These parcels of property exhibit high levels of pollutants and contaminants in the soil and the underlying ground water. Hazardous substances detected include trichloroethylene, trans-1,2-dichloroethene, vinyl chloride, and copper.

The cost-effective remedial action selected for this site includes: excavation and treatment via heat addition (rotary dryer) of approximately 10,000 cubic yards of organic contaminated soils within Parcel 1 and offsite disposal at an approved landfill; excavation and offsite disposal of approximately 4,000 cubic yards of contaminated soils within Parcels 2, 3, and 4; preparation of a supplemental RI and FS to identify the extent of ground water contamination and develop and evaluate appropriate remedial alternatives; and provision of an alternate water supply for affected Borough of Franklin residents by constructing a pipeline connection to the Borough of Hamburg public water supply system. The estimated capital cost for the selected alternative is $7,005,000 with disposal in a sanitary landfill, and $11,735,000 with disposal in a RCRA landfill. The annual O&M cost is $179,000.

PERFORMANCE STANDARDS OR GOALS: The soil remediation criteria are based on: 1) EPA maximum contaminant levels for VOCs in drinking water and 2) New Jersey Environmental Cleanup Responsibility Act guidelines for inorganic chemicals. The action levels set for the site are: TCE 5 ug/l; PCE 5 ug/l; chromium (total) and lead 100 mg/kg; zinc 350 mg/kg; and copper 170 mg/kg.

KEYWORDS: Alternate Water Supply; Alternative Technology; Carcinogenic Compounds; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Heavy Metals; O&M; Offsite Disposal; PCE; Risk Assessment; Soil; State Criteria; TCE; VOCs.

PRICE LANDFILL, NJ
Second Remedial Action - Final
September 29, 1986

ROD ABSTRACT

Price Landfill (also known as "Price's Landfill Number One" and "Price's Pit") is a 26-acre site located in Egg Harbor Township and Pleasantville City, Atlantic County, NJ approximately six miles northwest of Atlantic City, NJ. The relatively flat site is located within the 11,600-acre watershed of Absecon Creek. Land use in the immediate area consists of residential properties, small business properties, sand and gravel excavations, and undeveloped rural lots. Price landfill was originally a sand and gravel excavation operation owned by Mr. Charles Price, which ceased operating in 1968 when the pit was excavated to within approximately two feet of the water table. In 1969, the facility became a commercial solid waste landfill and in May 1971, began accepting a combination of both drummed and bulk liquid waste. Some liquid wastes were poured directly into the landfill from open tank truck spigots. Other waste was buried in 55-gallon drums, some of which were punctured or opened prior to disposal. An estimated 9.1 million gallons of chemical wastes were disposed of at the site. In 1980, residential wells in the area were found to be contaminated with volatile organic compounds, and the Atlantic County Health Department recommended that their use as a potable water supply be discontinued. As an interim measure, potable water was provided from tank trucks and, in December 1981, 37 affected residents were connected to the New Jersey Water Company (NJWC) System. During the summer of 1982, EPA and the State of NJ implemented Initial Remedial Measures to assure against the contaminant plume reaching the Atlantic County Municipal Utilities Authority (ACMUA) public water supply wellfield. These measures included the construction of an interconnection with the NJWC system, redevelopment of three ACMUA production wells, installation of granular activated carbon filtration units, and implementation of a water conservation program. In September 1983 EPA issued a Record of Decision based on the results of a 1982 RI/FS. The selected option included: abandonment of the ACMUA existing upper and lower Cohansey aquifer water supply wellfield; relocation and replacement of the ACMUA wellfield and transmission facilities to provide a 13.5 million gallon per day capacity; and consideration, in addition to the wellfield relocation, of plume management, source control, and ground water treatment alternatives. EPA began negotiations in 1984 with identified potentially responsible parties. Meetings and court appearances were held with EPA, New Jersey Department of Environmental Protection, and the potentially responsible parties, resulting in a tentative $17.15 million cash settlement for past and future costs. The primary contaminants of concern include: VOCs, organics, inorganics, and TCE.

The selected remedial action includes: installation of a security fence around the landfill site; installation of ground water extraction wells adjacent to the landfill to control the contaminant source; installation of ground water extraction wells hydraulically downgradient from the landfill to abate the contaminant plume; construction of a ground water/leachate pretreatment facility at or near the site; construction of a force main to the ACMUA interceptor system; extraction of contaminated ground water, followed by pretreatment, and ultimate disposal and treatment at the ACMUA waste water treatment plant; quarterly monitoring of ground water quality for approximately 25 years; and construction of a landfill cap at the conclusion of the ground water extraction process. The estimated capital cost is $9,050,000 with annual O&M for years 1-5 of $1,010,000 and $255,000 for years 6-25.

PERFORMANCE STANDARDS OR GOALS: A series of shallow wells, serving as source control wells, will be pumped at a combined rate of approximately 200,000 gallons per day for 25 years. The wells would extract ground water having a TVO concentration fluctuating to as high as 50ppm. A series of deeper wells, serving as plume abatement wells, would pump at a combined rate of approximately 1.1 mgd and extract ground water having an average TVO concentration of 1ppm until TVO concentration reaches 10ppb or less.

KEYWORDS: Air Emissions; Air Stripping; Ground Water; Ground Water Monitoring; Ground Water Treatment; Inorganics; O&M; Offsite Disposal; Organics; PRP; Sludge; Surface Water; TCE; VOCs.

ROCKAWAY BOROUGH WELL FIELD, NJ
First Remedial Action
September 29, 1986

ROD ABSTRACT

The Rockaway Borough Well Field site is located in Rockaway Borough, Morris County, New Jersey, and consists of three municipal supply wells which are in a glacial aquifer designated by EPA as the sole source aquifer for Rockaway Borough and the surrounding communities. High concentrations of TCE and PCE have been detected in the aquifer since 1980, but no sources of contamination have been identified. In 1981, the Borough of Rockaway constructed a three-bed granular activated carbon adsorption system to treat contaminated well water. Treatment has effectively reduced volatile organic contaminant concentrations in finished water to less than 1 part per billion (ppb). Although thirteen VOCs have been detected in the well water, TCE and PCE are the primary contaminants of concern. The site was listed on the NPL in December of 1982, and the RI/FS was initiated in 1985.

The selected remedial action for the Rockaway Borough site includes: Rockaway Borough maintaining the existing filtration system and modifying operations to ensure compliance with Safe Drinking Water Act standards; and EPA continuing the RI/FS in an attempt to identify the source and extent of contamination and evaluate additional remedial action alternatives to address source control. Estimated capital cost of this remedial action is zero with annual O&M costs of $74,800.

PERFORMANCE STANDARDS OR GOALS: The treatment system was designed to remove TCE and PCE to 5ppb.

KEYWORDS: Drinking Water Contaminants; Drinking Water Standards; Granular Activated Carbon; Ground Water; Ground Water Treatment; Municipally-Owned Site; O&M; PCE; Sole Source Aquifer; TCE.

SHARKEY LANDFILL, NJ
First Remedial Action - Final
September 29, 1986

ROD ABSTRACT

The Sharkey Landfill site comprises approximately 90 acres in the Parsippany - Troy Hills and East Hanover Townships, Morris County, NJ. The site consists of 4 disconnected areas: North Fill, South Fill, Northwest Fill, Southwest Fill. Two aquifers are found at this site. The upper aquifer, which comes into contact with fill material in portions of the landfill, primarily drains into the bordering Rockaway and Whippany Rivers. These rivers are used for recreational activities, and the Rockaway serves as a potable water source further downstream. The Passaic Valley Water Commission utilizes this aquifer for public supply. The lower aquifer completes a public supply well in East Hanover Township. In 1945 the site began accepting municipal solid waste from NJ counties. Between 1962 and 1969, Ciba-Geigy Co. allegedly disposed of 753,000 lbs. of hazardous and/or toxic materials. From April 1972 to May 1972, 25,700 tons of non-chemical wastes and 1,160 tons of "liquid and/or chemical wastes" described as cesspool-type, and sludge from the adjacent Parsippany-Troy Hills Sewage Treatment Plant (PTHSTP) were also deposited at the site. Between 1979 and 1981 refuse was removed from the South Fill portion of the site and re-disposed in the North Fill area for a PTHSTP expansion. Currently, landfill contaminants have migrated and continue to migrate into the shallow aquifer beneath the site and the adjacent surface water bodies. Although available data do not suggest that significant quantities of hazardous substances are being released at the present time, there exists the potential for future releases of contaminants at levels which could pose a serious threat to public health and the environment. The primary contaminants of concern include: VOCs, TCE, organics, inorganics, and heavy metals.

The selected remedial action includes: capping of the landfill in accordance with relevant RCRA Act requirements, including the appropriate grading of fill areas; a venting system for landfill gases; extraction and treatment of shallow ground water and leachate; surface water controls to accommodate seasonal precipitation and storm runoff as well as erosion control for river banks; security fencing to restrict site access; and environmental monitoring program to ensure the effectiveness of the remedial action. The estimated capital cost is $23,173,000 with annual O&M of $330,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards or goals not outlined in the ROD.

KEYWORDS: Capping; Flood Plain; Ground Water; Ground Water Treatment; Heavy Metals; Inorganics; O&M; Organics; RCRA Landfill Specifications; RCRA Part 264; Soil; State Requirements; Surface Water; TCE; VOCs.

SYNCON RESINS, NJ
First Remedial Action
September 29, 1986

ROD ABSTRACT:

The Syncon Resins site encompasses approximately 15 acres and is located in a heavily industrialized area of northern New Jersey. The Syncon Resin facility produced alkyd resin carriers for pigments, paints, and varnish products. In the production process excess xylene or toluene was separated from the wastewater and reused in subsequent reactions. The remaining wastewater was subsequently pumped to an unlined leaching pond (lagoon) to evaporate or percolate into the soil. The sampling performed during the remedial investigation indicated extensive onsite contamination in the soil, ground water, building dirt/dust, and stainless vessels and tanks. Four general classes of chemical contaminants were found onsite: organic compounds, pesticides, PCBs and metals.

The cost-effective remedial action selected for this site includes: removal of storage tank and vessel contents for offsite disposal; decontamination of buildings and tank structures as necessary; excavation of 2,700 cubic yards of lagoon liquids, sediments and grossly contaminated surface soils with offsite disposal; installation of a site cover that would allow natural flushing; pump and treatment of ground water; and conduction of supplemental studies to evaluate methods which enhance the effectiveness of flushing and/or treatment and destruction of contaminated soils. The estimated capital cost for the selected remedial action is $5,600,000 with annual O&M costs of approximately $209,000.

PERFORMANCE STANDARDS OR GOALS: Soil removal to achieve: PBCs 5ppm; base neutrals 100 ppm; TVOs 1 ppm; chromium 15 ppm; lead 317 ppm; mercury 1 ppm; nickel 18 ppm; zinc 196 ppm; arsenic 20 ppm; cadmium 3 ppm. No standards have been set for ground water treatment.

KEYWORDS: Alternative Technology; Arsenic; Chromium; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; O&M; Offsite Disposal; Organics; PCBs; Pesticides; Soil; VOCs.

VESTAL WATER SUPPLY WELL 1-1, NY
First Remedial Action
June 27, 1986

ROD ABSTRACT

The Vestal Water Supply Well 1-1 is located in the Town of Vestal, Broom County, NY on the south bank of the Susquehanna River with an industrial park immediately to the southeast of the well, and several marsh areas and drainage ditches encompassing and interlacing the industrial park. Well 1-1 is one of three production wells in Water District 1 intended to provide drinking water to several water districts in the Vestal area. In 1978 a chemical spill at the IBM plant in Endicott, a town across the Susquehanna River, led to a testing program for all drinking wells in the vicinity for synthetic compounds. As a result of this testing, significant concentrations of chlorinated solvents were discovered in well 1-1, and the well pumpage was diverted to the Susquehanna River where it presently continues to discharge under an NPDES permit. Subsequent investigation has since indicated that the presence of chlorinated solvents in the well is not related to the spill at the IBM plant. In late 1982 an investigation, contracted by the Town of Vestal, implicated, in part, the area around the southeast corner of Stage Road as a suspected source. This is an area which borders with the industrial park along Stage Road. In July 1985 the EPA rejected an FS recommendation to construct a large capacity water main between Water Districts 1 and 5 in order to improve the reliability of the District 1 supply. This recommendation was rejected because the agency believed that a sufficient capacity of good quality water still existed for the service area, and that no short-term threat of losing this capacity was present. The primary contaminants of concern include: VOCs, and TCE.

The selected remedial action includes: restoration of District 1 water supply capacity to the level that existed prior to loss of well 1-1; provision of a water supply to the district that exceeds applicable or relevant and appropriate standards, thereby providing a very high level of public health protection; hydraulic containment of the plume of contaminants via pumping well 1-1, thereby protecting other District 1 water supply wells; and cessation of untreated discharge from well 1-1 to the Susquehanna River. The estimated capital cost is $389,400 with annual O&M costs of $119,750.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards not outlined in the ROD.

KEYWORDS: Air Stripping; Alternate Water Supply; Drinking Water Contaminants; Ground Water; Ground Water Treatment; O&M; Solvents; TCE; VOCs.

ARMY CREEK LANDFILL, DE
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Army Creek Landfill (ACL), formerly known as the Llangollen Landfill, is located approximately two miles southwest of New Castle, Delaware, and is adjacent to the Delaware Sand and Gravel Landfill Superfund site. ACL, a former sand and gravel quarry, is owned by New Castle County. The County operated this 44-acre landfill, which accepted municipal wastes, from 1960 until its closure in 1968 when it was filled to capacity. An estimated 1.9 million cubic yards of refuse were landfilled at the site, 30 percent of which (or approximately 600,000 cubic yards) now lies below the seasonal high water table. In late 1971, water in a residential well downgradient of the site developed quality problems. Results from a subsequent investigation showed that leachate, most likely originating from the Army Creek and Delaware Sand and Gravel Landfills, was contaminating local aquifers. This lead to the installation of a ground water recovery system designed to maintain a ground water divide between the landfills and the Artesian Water Company Wellfield located downgradient of the landfills. The primary contaminants of concern include: VOCs, inorganics, heavy metals, benzene, and chromium.

The selected remedial action for this site will be implemented in a two-phased approach. Phase 1: Install a RCRA-type cap to minimize infiltration of rainwater. Capping of the landfill will include site clearing, regrading of the existing cover surface, adding soil backfill to achieve grades, installing the cap with gas vents, and construction of drainage ditches to direct run-off away from the landfill; continue operation of the downgradient recovery well network; and evaluate the capping system and the downgradient pumping network for five years after the cap is installed. This evaluation will include, but not be limited to, monitoring water levels, pumping rates and water quality. Phase 2: After the five year evaluation period, a determination will be made on whether to install upgradient controls to intercept lateral ground water inflow on the northwestern boundary of the landfill; and continue monitoring the water levels, pumping rates and water quality as in Phase 1. O&M will include as a minimum, regular inspections and, as necessary, repairs to the RCRA cap. The ground water recovery system will be monitored to assure that it is capturing the contaminated plume. The estimated capital cost for this two-phased remedial action is $12,030,000, or $12,340,000 with upgradient controls. O&M costs are estimated at $306,000, or $388,000 with upgradient controls.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards not outlined in the ROD.

KEYWORDS: Capping; Chromium; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; Municipally-Owned Site; O&M; Sediments; Soil; State Permit; Surface Water; RCRA Closure Requirements; VOCs; Water Quality Criteria.

BLOSENSKI LANDFILL, PA
First Remedial Action
September 29, 1986

ROD ABSTRACT:

The Blosenski Landfill site is located on 13.6 acres in West Caln Township, Chester County, PA. The site is bordered by heavily wooded and agricultural areas. Approximately 467 residents live within one mile of the site. Beginning in the 1950s the site operated as a landfill accepting municipal and industrial wastes. In 1971 the site was purchased by Mr. Joseph Blosenski, who operated the landfill until the early 1980s. Wastes were randomly dumped on the surface during the operating period, and included solvents, waste water treatment sludges, demolition and construction wastes, undercoating materials and open and leaking drums. Numerous citizen complaints of odors, smoke and airborne debris led to petition and regulatory actions against Mr. Blosenski. In 1982, EPA conducted a Site Inspection and found serious ground water contamination. The primary contaminants of concern are VOCs including benzene, toluene and TCE, and inorganics including lead, cadmium, chromium and mercury.

The selected remedial action for the site will be conducted in four phases. Phase I: install a public water supply to 12 residences; Phase 2: excavate and remove buried drums and other material, with offsite disposal in a RCRA landfill; Phase 3: perform a pre-design study to further sample ground and surface waters to delineate extent and magnitude of contamination. Based on the results of the study, ground water will be pumped and treated for a maximum of two years to ACLs established by EPA; Phase 4: install a low permeability RCRA cover on the landfill, divert surface water and construct a gas venting system. Phases 1-3 will be implemented concurrently. Estimated capital cost of the remedy ranges between $11,000,000 and $15,000,000, with a baseline cost of $13,000,000. O&M costs are estimated to be $534,300 for the first two years.

PERFORMANCE STANDARDS OR GOALS: Ground water will initially be treated to ACLs, then to levels established by NPDES.

KEYWORDS: ACL; Alternate Water Supply; Capping; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Heavy Metals; O&M; Offsite Disposal; Organics; RCRA Closure Requirements; Soil; Surface Water Diversion/Collection; Toluene; VOCs.

BRUIN LAGOON, PA
Second Remedial Action - Final
September 29, 1986

ROD ABSTRACT

Bruin Lagoon is located about 45 miles north of Pittsburgh in Bruin Borough, Butler County, PA. The site occupies over four acres and is located along the western bank of the South Branch of Bear Creek, approximately seven miles upstream of the creek's confluence with the Allegheny River. The site is also partially situated in the 100-year flood plain of the creek. The commercial and main residential areas of Bruin Borough are located less than five blocks from the site and over 30 residences lie within 500 feet of Bruin Lagoon. Beginning in the 1930s, Bruin Oil Company, located on property adjacent to the site, used the lagoon for disposal of wastes resulting from the production of white oil (mineral oil). Disposal operations continued for more than 40 years. In 1968 a breach in the lagoon dike caused an acidic sludge spill into the South Branch of Bear Creek which killed 4 million fish in the Allegheny River. An RI/FS report, begun in July 1981, resulted in a remedial action between August 1983 and May 1984. The first remedial action included: removal of liquid floating on top of the open lagoon and offsite disposal; lagoon and dike stabilization; removal of scrap tanks and equipment; installation of a multi-layer impermeable cap; and construction of a channel to prevent ground water from entering the site. In May 1984 a previously unidentified sludge layer, releasing toxic gases, was penetrated during remedial construction. EPA declared an emergency situation, stopped all remedial activities, and initiated an immediate emergency action. These actions were terminated in September 1984 after the site was stabilized and secured. EPA, upon completion of the emergency work, determined the need for a reevaluation of the site. Approximately 17,500 cubic yards of soils and bedrock are contaminated with toxic gases, heavy metals, oils, inorganics, and acidic sludge.

The selected remedial action includes: onsite stabilization/-neutralization of sludge and perched liquid zone; in-situ treatment of bedrock underneath the former lagoon area; completion of dike reinforcement; capping the former lagoon area with a multi-layer cap; and monitoring and maintenance of the site, cap and ground water. The estimated capital cost is $2,695,000 with annual O&M of $16,000.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards not outlined in the ROD.

KEYWORDS: Acids; Alternative Technology; Capping; Dike Reinforcement; Flood Plain; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; O&M; Oils; Organics; Sediments; Sludge; Stabilization; Surface Water.

CHISMAN CREEK, VA
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Chisman Creek site, located in Southeastern York County, VA, is in a 520-acre sub-watershed of the Chisman Creek coastal Basin on the Virginia Peninsula. As a tidal estuary, Chisman Creek flows easterly into Chesapeake Bay. Approximately 500 to 1,000 people live within one mile of the site in this primarily residential area. Chisman Creek supports private and commercial marinas and numerous private docks, and is also a popular fishing area. In 1957 and 1958, two units of the Virginia Power Yorktown Power Generating Station began burning coal mixed with coke from a nearby petroleum refinery. Fly ash was produced by these units until 1974. A private contractor, employed between 1957 and 1974 to haul the fly ash from the generating station, disposed of large quantities of this incinerated coal by-product in four abandoned sand and gravel pits in the Chisman Creek watershed, approximately two miles south of the generating station. No dust control measures were employed during the hauling, and uncontrolled erosion caused fly ash to wash from the pits into Chisman Creek and its tributaries during heavy rains. The remedial investigation conducted at the site found 484,600 cubic yards of contaminants in the fly ash, the sediments of Chisman Creek and its tributaries, the ground water within and adjacent to the pits, and in surface water. The primary contaminants of concern include: trace metals (nickel and vanadium), and inorganics.

The selected remedial action includes: capping Areas A and B with a soil layer overlaid with topsoil and vegetative growth; capping Area C with a low-permeability compacted soil layer overlaid with topsoil and vegetative growth; installation of a subsurface drain on the west, south, and east sides of Area C to lower the water table below the bottom of the fly ash; transportation of ground water drainage from Area C to an onsite treatment plant; extension of the Newport News and the Allen Mill Road waterlines to affected homes; and implementation of deed restrictions or other controls to prohibit excavation of soil and restrict onsite building and ground water use. EPA is deferring any remedial action decisions on the streams and adjacent ponds until a study by the U.S. Fish and Wildlife Service is complete. The estimated capital cost for this remedy is $14,119,000 with O&M costs for year one of $506,000 and $64,000 for years 2-30.

PERFORMANCE STANDARDS OR GOALS: The recommended action for nickel complies with the Ambient Water Qualty Criteria (AWQC) for the protection of fresh water aquatic life (88ug/l to 280ug/l) and the AWQC for the protection of salt water aquatic life (17ug/l). Once ground water being collected through the drain is shown to meet National Pollutant Discharge Elimination Systems Limits, the treatment will cease.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented to prohibit excavation of soil, and restrict onsite building and ground water use.

KEYWORDS: Alternate Water Supply; Arsenic; Capping; Deed Restrictions; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; Institutional Controls; O&M; Onsite Treatment; Sediments; Surface Water; Wetlands.

DELAWARE CITY PVC, DE
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Delaware City PVC site is located two miles northwest of Delaware City, New Castle County, Delaware. In 1966 Stauffer Chemical Company (SCC) of Westport, Connecticut, founded the Delaware City PVC Plant, which is used for the manufacturing of polyvinylchloride resin (PVC), polyvinyl acetate and other polymers. From 1971 to 1974 off-grade PVC resin, sludge from the wastewater treatment system and residue from the stripping process were disposed of in two onsite pits. These "buried sludge pits" were closed and covered in 1979. Off-grade PVC resin was disposed of in a third pit. This material was removed and the pits backfilled in 1974. In May 1981 Formosa acquired the PVC manufacturing and processing facility and has continued operations to present. The two buried sludge pits and the third disposal pit were retained by SCC as part of its Carbon Disulfide Plant, located adjacent to the PVC Plant property. An EPA conducted inspection in May 1982 indicated serious contamination of the shallow ground water. Currently 25,000 cubic yards of ground water, surface water, and soils are contaminated with PVC, benzyl chloride monomer (VCM), TCE, and 1,2-dichloroethane (EDC).

The description of the selected remedial action for each area of this site is provided below. Off-Grade Batch Pits: excavate and remove existing PVC sludge and contaminated soils; install a double synthetic liner; and install monitoring wells, and perform quarterly sample analysis for TCE, EDC, VCM. The excavated material will be processed and recovered (estimated at 80-85%) as a saleable finished product to the maximum extent possible. Non-recoverable material will be disposed of offsite at an approved RCRA facility. Stormwater Reservoir: The same remedy as described for the above off-grade batch pits. Unlined Ditches: excavate and remove PVC sludge and dispose of at an approved RCRA facility; and install a single synthetic liner. Aerated Lagoons: excavate and remove PVC sludge; clean and repair lagoons as necessary; install a double synthetic liner; and install monitoring wells, and perform quarterly sampling analysis for TCE, EDC and VCM. The excavated material will be recovered to the maximum extent possible (estimated to be 80-85%) and non-recoverable material will be disposed of offsite at an approved RCRA facility. Closed Buried Sludge Pits: place a drainage layer on top of the existing synthetic cap; and cover with a second synthetic cap and topsoil, and revegetate. Former PVC Storage Area: cover and cap the entire area with a double synthetic cap. Ground Water: install a line of six ground water recovery wells at the northern edge of the contaminant plume, and another six wells at the southern edge. Reuse the collected ground water in Formosa's plant operations. During periods of low water demand in the plant, treat the ground water in the existing waste water treatment plant. Install two monitoring wells at the southern edge of the plume. Provide an alternate water supply for existing contaminated wells. Operation and Maintenance: as a minimum, regular inspections and, as necessary, repairs to the liners and caps. The ground water recovery system will be routinely monitored to assure that it is capturing the contaminated plume. The estimated capital cost for the remedy is $1,904,000 with annual O&M costs of $43,000.

DELAWARE CITY PVC, DE
First Remedial Action
(Continued)

PERFORMANCE STANDARDS OR GOALS: Recovery wells will operate until concentration of VCM, EDC, and TCE reach 1 ppb, 0.94 ppb, and 2.7 ppb respectively for two consecutive sample analyses.

KEYWORDS: Alternate Water Supply; Capping; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; O&M; Offsite Disposal; Organics; Soil; Surface Water; TCE; VOCs.

DRAKE CHEMICAL, PA
Second Remedial Action
May 13, 1986

ROD ABSTRACT:

The Drake Chemical site is located in Lock Haven, Clinton County, PA. Between 1962 and 1982 Drake Chemical, Inc. (DCI) manufactured batches of specialty, intermediate chemicals for producers of dyes, pharmaceuticals, cosmetics, herbicides, and pesticides. The herbicide Fenac, manufactured at the plant, is a major site contaminant. The eight-acre inactive site contains six major buildings. Inside and surrounding the process buildings are approximately sixty process tanks and reactors. Approximately ten large tanks used for bulk storage of acids, bases, and fuel oils are outside. Also located onsite are two lined and three unlined wastewater treatment lagoons. Chemical sludge and 3,900 cubic yards of contaminated soil cover underlie much of the open area while construction debris is strewn about. Drums and bulk waste may be buried at the site. The primary contaminants of concern include: inorganics and organics including toluene, benzene, TCE, and xylene.

The selected remedy is the second phase of a three phase cleanup action. It includes: drainage and removal of 192,000 gallons of liquid and sediments from the two lined lagoons and treatment in an offsite RCRA-permitted facility; removal of all tanks, buildings, and debris; decontamination of all metal structures that can be salvagable as scrap; disposal in a RCRA facility any material not decontaminated and treatment of any liquids removed to a RCRA-permitted treatment facility; incineration of warehouse-stored chemicals at an offsite RCRA-permitted incinerator; and analysis and disposal (if needed) of the decontamination fluid in a RCRA-permitted facility. The estimated baseline capital cost for this remedy is $3,143,000 with no anticipated O&M costs.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Alternative Technology; Carcinogenic Compounds; Direct Contact; Flood Plain; Ground Water; Incineration; Inorganics; Offsite Disposal; Organics; RCRA Part 264; Sludges; Soils.

INDUSTRIAL LANE, PA
First Remedial Action
September 29, 1986

ROD ABSTRACT:

The Industrial Lane site encompasses approximately two square miles in Wiliams Township, Northampton County, Pennsylvania. A portion of the Chrin Landfill, a Pennsylvania Department of Environmental Resources permitted landfill, is on the site as are several active and abandoned industrial properties, commercial establishments, railroads and farming/residential areas. As a result of the detection of low level ground water contamination, the Chrin Landfill was placed on the NPL in February 1983. In addition to the preparation of a Remedial Investigation, two Feasibility Studies for the Industrial Lane site were also prepared. The first, known as Operable Unit I, focuses on the remedial alternatives for private well users. The second, Operable Unit II, will focus on remedial actions addressing ground water remediation. No consistent contaminant plume has been detected to date due to the complex geology of the area. Possible industrial activities contributing to the contamination include, but may not be limited to, iron ore extraction and iron works operations. The possibility also exists that refuse and/or other unknown substances were more recently disposed of into one or more of the iron ore extraction pits on the Chrin Landfill and industrial complex facility. While residential wells located upgradient of the Chrin Landfill have historically contained only background levels of VOCs, the chemicals detected in wells within the Glendon Boro residential community represent the primary contaminants of concern. These include tetrachloroethene, trichloroethane, and chloroform.

The selected remedial action for this site involves the provision of an alternate water supply to approximately 15 households. Since existing curb service is available this action only involves installation of several lines to the designated households. The estimated capital cost for this action is $30,800 with no annual O&M.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

INSTITUTIONAL CONTROLS: Possible restrictions of ground water use by future developments and of future well construction at existing residences.

KEYWORDS: Alternate Water Supply; Background Levels; Drinking Water Contaminants; Ground Water; Institutional Controls; TCEs; VOCs.

LANSDOWNE RADIATION, PA
Second Remedial Action
September 22, 1986

ROD ABSTRACT

The Lansdowne Radiation site consists of two attached residences located at 105/107 East Stratford Avenue, Lansdowne, PA. The building is located in a residential area, approximately two miles from Philadelphia. The dwellings were contaminated with radium and other radionuclides between 1924 and 1944 as a result of work done in one of the houses. In 1924 Dr. Dicran Kabakjian, a professor of physics at the University of PA, opened up what was essentially a family-run business to refine radium and produce medical devices in his home at 105 E. Stratford Avenue. After Dr. Kabakjian's death in 1945, from conditions not linked directly to radium exposure, the house twice changed ownership; first to the Tallant family, then to the Kirzirian family. In 1963, based on information gathered from private individuals, the State Department of Health inspected the house and found extremely high levels of radiation. A decontamination effort in 1964 consisted of removing as much radium as practical by sanding, scraping, vacuuming, and washing the house walls, floors and ceilings. Some concrete floor and wooden floor boards were also removed. After cleanup, the house received epoxy-based paint coatings to limit the outward migration of the radium that remained deeply embedded in the actual structure. In December 1964, four months after the completion of the decontamination, the U.S. Public Health Service (USPHS), basing its report on a 16 hour-per-day-exposure, concluded the radiation dose rate received by the occupants, the Kizirian family, was just above the then existing guidelines of 0.5 rem/yr, and that further decontamination of the house would be impractical. Contamination at the Bashore family home at 107 E. Stratford Avenue was not addressed. The first remedial action at this site, initiated in August 1985, provided temporary housing for one of the residents. The other resident had previously moved out. No further decontamination can currently be performed without removing the structural members, walls, and floors. Furniture and appliances that can not be decontaminated are pending remedial actions. The primary contaminant of concern is radium with actinium, thorium, and protactinium as secondary contaminants.

The selected remedial action for this second operable unit includes: dismantling of the twin house. All radioactive materials above established permissible levels will be packed and sealed in approved containers, and disposed of at an approved offsite disposal facility; contaminated soil located in and around the house will be excavated and removed to established permissible levels. Some soil in surrounding lots along the property lines may be removed if sampling or monitoring during excavation shows migration of the radium beyond the original property; the sewer lateral leading from the contaminated house to Stratford Avenue will be removed; approximately

LANSDOWNE RADIATION, PA
Second Remedial Action
(Continued)

two hundred feet of sewer line from in front of the house to Union Avenue will be replaced; and O&M will include maintenance of the vacant property lot. The capital cost has been estimated at $4,000,000-$4,500,000 with O&M costs reported to be "minimal".

PERFORMANCE STANDARDS OR GOALS: Soil will be excavated and removed to a 5-15 pCi/g level; radon contaminated materials will be removed to a 0.03 WL; gamma contaminated materials will be removed to the 0.17 rem/yr permissible level.

KEYWORDS: Air; Excavation; O&M; Offsite Disposal; Radioactive Materials; Relocation; Soil.

LEETOWN PESTICIDE, WV
First Remedial Action - Final
March 31, 1986

ROD ABSTRACT

The Leetown Pesticide site is located in northeast West Virginia, approximately 8 miles south of Martinsburg, West Virginia. The "site" is actually composed of a number of areas affected by surface disposal of pesticides, agricultural use of pesticides, and landfilling. A total of eight specific areas of waste disposal or accumulation were identified during the initial RI study. Of these eight areas, two were the result of alleged disposal of pesticide-contaminated debris from a fire that occurred in 1975 at the Miller Chemical Company. These two areas include the former pesticide pile and the suspected pesticide landfarm areas. Four of the contaminated areas are associated with former use of the land for orchard production. The two remaining sites are active landfills.

The results of the contaminant release and exposure study indicate that the suspected landfarm and apple orchards do not appear to comprise significant sources of environmental contamination. The only three areas out of the eight investigated that present concentrations of pesticides above ambient soil background (non-pesticide use areas) and orchard background levels (pesticide application areas) are the following:

. Former Pesticide Pile Area (presently: Robinson Property)
. Former Jefferson Orchard Mixing Area (presently: Robinson Property)
. Former Crimm Orchard Packing Shed (presently: Tabb Barn).

The selected remedial action for this site includes: excavation and consolidation of approximately 3600 cubic yards of contaminated soil from the three areas mentioned above; placement of these soils in an onsite "treatment bed" to enhance anaerobic biodegradation of the pesticide contamination; removal and offsite disposal of the contaminated flooring, a wooden spray wagon, and drums of pesticide product in a permitted hazardous waste facility; construction of a monitoring well network; and construction of surface water diversion systems, sedimentation channels, and diversion dikes. Total capital cost for the selected remedial alternative is estimated to be $1,014,000 with O&M costs approximately $10,000 for the first year and $7,500 for the second.

PERFORMANCE STANDARDS OR GOALS: The average target soil concentration for DDT and its metabolites for all soils placed in the treatment bed is 300 ppb. This concentration is required to reach a 10^{-5} carcinogenic risk for inhalation, which is equivalent to the 10^{-6} carcinogenic risk for dermal contact.

KEYWORDS: Alternative Technology; Excavation; Ground Water Monitoring; Inorganics; Offsite Disposal; Organics; Pesticides; Sediments; Soil; Surface Water Diversion/Collection; Treatability Studies.

LIMESTONE ROAD, MD
First Remedial Action
September 30, 1986

ROD ABSTRACT

The Limestone Road site is located 2.5 miles east southeast of Cumberland, Allegheny County, MD on the western flank of Irons Mountain. The 210-acre site consists of two parcels of land, the former Diggs Sanitation Company (DSC-20 acres) and the Cumberland Cement and Supply Company (CC & SC - 191 acres). The site is bordered on the southwest by several residences, and immediately to the northwest lie the Cumberland City Dump and undeveloped land. The site includes large areas of landfilled and dumped commercial, residential and demolition refuse on both properties. About 110 tons of a chromium containing sludge were also disposed of on the properties. Currently, 18 residences are within a half-mile downhill of the site, 5 within 100 yards, and one on the Diggs property. The water supply for these residences is ground water from private wells. Ground water in the area of the site has the potential to be contaminated with inorganic and organic constituents. In the mid 1970s, Mr. Charles Steiner, President of CC & SC, began allowing various contractors to dump clean fill (housing demolition material) on the property to provide a larger and more level working surface. However, a variety of waste has reportedly been dumped into a ravine on the property. In April 1981, Mr. Joseph Diggs, a licensed hazardous waste hauler and owner of DSC, was allegedly involved in the dumping of 99 tons of hazardous waste containing chromium, lead, and cadmium into a ravine on CC & SC property. In addition, an alleged 11 tons of hazardous waste have been reportedly disposed of on the Diggs property as an extension of previous filling and grading operations. The nearby Cumberland City Dump functioned as a municipal landfill from 1932 to 1968. Fly ash, miscellaneous solid metal wastes, and numerous tires are currently exposed on the northern and southern faces of the dump. Several crushed and rusted drums were noted along the banks of the inactive landfill. The primary contaminants of concern include: VOCs, base-neutral compounds, TCE, PCE, heavy metals.

The selected interim remedial action includes: site grading; capping of contaminated soil on all properties; fencing of both properties; continued monitoring of groundwater, surface water, and sediment; complete historical review of pertinent geological information; collection of regional offsite and onsite geological information; chemical analysis of the shale to determine its composition; reevaluation and establishment of background data control points; frequent sampling to increase the data base; increase in the number of stream and residential sampling; and evaluation of the effects of natural and/or domestic (plumbing) conditions on the overall water quality of the area. The estimated capital cost is $1,192,580. O&M cost will be determined after completion of ground water studies.

PERFORMANCE STANDARDS OR GOALS: Specific performance standards not outlined in the ROD.

LIMESTONE ROAD, MD
First Remedial Action
(Continued)

INSTITUTIONAL CONTROLS: Deed restrictions for soil and fencing of the CC & SC and DSC properties.

KEYWORDS: Capping; Chromium; Ground Water; Ground Water Monitoring; Inorganics; Interim Remedy; Organics; Sediments; Surface Water; TCE; VOCs.

MIDDLETOWN ROAD, MD
First Remedial Action - Final
March 17, 1986

ROD ABSTRACT

The Middletown Road Site is a privately owned waste dump, consisting of approximately 2.3 acres, located off Maryland Route 50 near Annapolis, Anne Arundel County, Maryland. The site operated as a dump, primarily for rubble and construction debris, for several decades without proper State permits. In 1981, it was discovered that approximately 40 drums and four dumpster loads of suspected hazardous substances were on the site. On June 24, 1983, $384,000 in CERCLA money was allocated for immediate removal measures to excavate and remove hazardous substances and contaminated soil. The removal activities conducted at the site consisted of: the removal of contaminated soil and 5-gallon pails of marine paint; additional soil sampling to confirm adequate contaminant removal; installation of six ground water monitoring wells around the perimeter of the site; drum sampling, testing and the relocation of one million tires on the site in order to conduct a more comprehensive subsurface investigation. Material removed during the Immediate Removal Action included 68 drums, 70 contaminated tires, and 610 tons of contaminated soil.

A remedial investigation was conducted to determine whether any remedial action would be needed before deleting the site from EPA's National Priorities List. Based on the findings of the RI, no risk to receptors via direct contact, inhalation, or ingestion was found. Therefore, a No Action Alternative has been recommended, since there are no releases from the Middletown Road Site which may threaten public health. The State of Maryland will monitor onsite wells as a part of its existing closed waste site inspection schedule.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Ground Water Monitoring; No Action Alternative.

MILLCREEK, PA
First Remedial Action - Final
May 7, 1986

ROD ABSTRACT

The Millcreek site is a 84.5 acre tract of land located in Millcreek Township, Erie County, Pennsylvania. The site was once a 75-acre freshwater wetland. During the past 40 years, all but 4 acres have been filled with foundry sand and industrial and municipal waste. The site operated as an unpermitted active landfill during this time. For the past 15 years, unknown parties bulk disposed halogenated volatile solvents in soils in the eastern portion of the site. This disposal has resulted in significant ground water contamination both on- and offsite. Unit cancer risk calculations reveal that offsite ground water contamination exceeds 10^{-2} cancer risk levels adjacent to the eastern portion of the site. In addition, Region III's Remedial Investigation discovered extensive soil, sediment, and surface water contamination. The major clases of compounds detected included: polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), phthalates, volatile organics, phenols and metals such as lead and copper.

The selected remedial action for this site includes: excavation and consolidation of contaminated soil and sediments under a RCRA cap to meet proposed criteria; site grading; placement of a soil cover over the remaining soils not exceeding the proposed criteria; construction of surface water management basins and ditches; revegetation of soil cover and cap; installation of additional monitoring wells; construction of a flood retention basin on property owned by Millcreek Township; pumping and treatment of contaminated ground water; additional sampling and well installation; and ground water monitoring. Total capital cost estimates for the selected remedial alternative vary from $12,000,000 to $18,000,000 with an estimated baseline cost of $15,000,000. For these estimates, capital costs included all costs associated with excavation, regrading, revegetating, capping and ground water pumping and treating for two years. Additional sampling and monitoring wells will be considered as part of the design. Design is estimated to cost approximately $1,000,000 and will be funded entirely by trust fund monies. Total present worth cost for O&M is estimated to be $1,763,000.

PERFORMANCE STANDARDS OR GOALS: The tentative soil and sediment criteria and the ground water protection goals were based on a site-specific risk analyses presented in the EPA Region III technical support documents. The exception is the soil criteria for PCBs (10,000 ug/kg dry weight), which was based on a consensus policy for residential areas proposed to EPA by a committee of environmental organizations and industry groups. Soil cleanup goals for other compounds are: PAHs 2940 ug/kg (10^{-6} Unit Cancer Risk); phenols 9,000 ug/kg; toluene 1783 ug/kg; and trichloroethylene 10 ug/kg (Detection Limit).

MILLCREEK, PA
First Remedial Action - Final
(Continued)

KEYWORDS: Capping; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Heavy Metals; O&M; Onsite Containment; PAH; PCBs; Phenols; Risk Assessment; Sediments; Soil; Solvents; Surface Water; TCE; VOCs; Wetlands.

TAYLOR BOROUGH, PA
Second Remedial Action - Final
March 17, 1986

ROD ABSTRACT

The Taylor Borough site is located in the Borough of Taylor in Lackawanna County, Pennsylvania. The site is an abandoned landfill located in a strip mine. Underlying the site is a series of underground mines. As a result of the landfill operation, which ceased in 1968, the topography of the site consists of relatively rolling terrain between steep slopes of mine spoil piles and unreclaimed strip mines. In June 1985, a Record of Decision (ROD) was approved for the site. The ROD deferred a decision on ground water action because analytical results for ground water samples collected in April 1985 were not available. Additional consideration of site ground water conditions was also needed because of unusual hydrogeologic conditions.

In the June 1985 ROD, reference is made to a release of contaminants into a coal seam based on the analysis of samples collected from Well 3C in September 1984. As noted in the RI, the data validation review found that the reported results are of questionable accuracy. Additionally, the two subsequent sampling efforts that were attempted did not identify any contamination. Since no release of site contaminants to the ground water has been documented, there is no need for ground water remedial action at this time; however, a monitoring program is warranted to verify that no release is occurring. To meet this objective, existing monitoring wells in the coal seams underlying the site (wells 1B, 2C, 3C, 4C, 5B, 6A, 7C, 7D, 8B) should be monitored on a semiannual basis for all priority pollutant volatile organics and Hazardous Substance List metals for, at a minimum, five years after the surface remedial action is completed. It is estimated that the current cost to conduct one round of sampling and analysis for metals and volatiles at the monitoring wells identified is $8,000, or $16,000 for semiannual monitoring.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Ground Water Monitoring; No Action Alternative.

TYBOUTS CORNER LANDFILL, DE
First Remedial Action - Final
March 6, 1986

ROD ABSTRACT

The Tybouts Corner Landfill site is located in northern Delaware, approximately ten miles south of Wilmington, in New Castle County. The landfill consists of two fill areas. The main fill is about 47 acres in size and is located near the confluence of Pigeon Run and Red Lion Creek. A smaller fill area, estimated to be about four acres, is located just west of Pigeon Run. The site was originally a sand and gravel pit. When the landfill began to operate, plans indicate that no clay liner or other impervious material was placed below the fill and no impervious cap was placed on top of the fill following abandonment. Tybouts Corner Landfill was used by the New Castle County Department of Public Works as a municipal sanitary landfill for the disposal of municipal and domestic refuse from December 1968 until July 1971. In addition, industrial wastes were disposed there during the active life of the landfill. These industrial wastes included: trichloroethylene, vinyl chloride, 1,2-dichloroethane, benzene and various other organic and inorganic chemicals.

The main threat posed by Tybouts Corner Landfill is that the hazardous substances disposed of in the landfill are contaminating the local and regional aquifers which are a main source of water for the region. The selected remedial action for this site includes: excavation of all municipal and industrial wastes, as well as contaminated subsoils in the west fill and consolidation with the main fill; capping of the consolidated main fill area with a multi-layered RCRA cap; installation of a subsurface drain or trench system; implementation of a health and safety plan; and establishing a monitoring program. In addition, the offsite plume of contaminated ground water in the Upper Hydrologic Zone (UHZ) of the Potomac will be pumped and treated or otherwise disposed of, either onsite or offsite at a local sewage treatment plant. The goal of the offsite ground water treatment will be to reduce the level of contaminants to 100 ppb of total volatile organics, and 10^{-4} cancer risk level for cancer-causing contaminants. During the pumping, institutional controls will be utilized to prevent use of contaminated ground water. The ROD does not provide estimated capital cost and annual O&M for the selected remedial action.

PERFORMANCE STANDARDS OR GOALS: The goal of the offsite ground water pumping will be to reduce the level of contaminants to 100 ppb of total volatile organics. Separate standards will be used for the following cancer-causing contaminants: vinyl chloride 1.0 ppb; benzene 5.0 ppb; 1,2-dichloroethane 5.0 ppb. These standards are anticipated to meet the goals of a 10^{-4} cancer risk at the boundary of the landfill property.

INSTITUTIONAL CONTROLS: During pumping, institutional controls will be utilized to restrict the use of ground water.

TYBOUTS CORNER LANDFILL, DE
First Remedial Action - Final
(Continued)

KEYWORDS: Capping; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Institutional Controls; O&M; Organics; Publicly Owned Treatment Works (POTW); Soil; Toluene.

WESTLINE SITE, PA
First Remedial Action - Final
July 3, 1986

ROD ABSTRACT

The Westline Site is located in Westline, Lafayette Township, McKean County, PA. The site, encompassing approximately 40 acres, is bordered by Kinzua Creek to the South, Turnip Run to the east, and a wetland area to the west. For the purpose of this investigation, the northern border extends 250 feet north of the former chemical plant foundation. Located at the center of the site is a popular landmark, the Westline Inn. Beginning in 1901, the Day Chemical Company, converted lumber into charcoal, methanol and acetic acid. The plant changed owners three times before equipment deterioration and declining profits forced its closure in 1952. Several tar-like deposits from the wood chemical processing operations remain onsite. The largest deposit was excavated in September of 1983 by the removal action implemented by the EPA. Another tar deposit, approximately 6 inches deep and 1,500 square feet in total area, still exists. Several smaller tar deposits are located intermittently in the low-lying areas of the ground surface. Tar is also seen along the banks of an unnamed tributary. The FS has estimated a total of 710 cubic yards of tar and tar soils onsite. During the initial EPA site inspection in July of 1982, a sample of waste material was collected from tar seepage and analyzed for priority pollutants. Eighteen tentatively identified compounds were detected. In March 1986, a second wood tar sample was collected to verify the presence or absence of polynuclear aromatic hydrocarbons (PAH). The primary contaminants of concern include phenol, 2,4-dimethylphenol, PAH compounds.

The selected remedial action for this site includes: excavation of all wood tar deposits and subsequent hauling of these wastes to a permitted offsite facility; backfilling of the excavated areas with clean soil and vegetation; incineration of excavated deposits with a high heating value and low ash content technique; ground water verification study; and air monitoring. The baseline capital costs for this remedial action is $744,000. O&M will not be required for the areas where tar will be excavated, but periodic inspection of the areas to assure the remedy is effective will be necessary.

PERFORMANCE STANDARDS OR GOALS: The tar deposits will be excavated to the soil level. Sampling and analysis will be conducted during excavation to be sure contaminated soils are removed to a level equivalent to a 10^{-4} cancer risk for direct contact with soils over a 20 year period. This level is chosen because it is similar to some of the background levels found in the community. The removal of the tar deposits will also insure that the remaining PAHs in soils will not leach from the soils to the ground water in concentrations that will exceed levels equivalent to a 10^{-6} cancer risk for ingestion of ground water.

WESTLINE SITE, PA
First Remedial Action - Final
(Continued)

KEYWORDS: Excavation; Ground Water; Incineration; Offsite Disposal; Phenols; PAH; Sediments; Soils; Surface Water; Wetlands.

A. L. TAYLOR, KY
First Remedial Action - Final
June 18, 1986

ROD ABSTRACT

The A. L. Taylor site, also known as "Valley of the Drums", is located in a small valley in northern Bullitt County outside of Brooks, Kentucky. This site was first identified as a waste disposal site by the Kentucky Department of National Resources and Environmental Protection (KDNREP) in 1967. The owner, Mr. Taylor, excavated pits on site and emptied the contents of the drums into them and recycled the drums. Soil from nearby hillsides was eventually used to cover the pits. Thousands of drums were also stored on the surface. Mr. Taylor never applied for the required State permits throughout the history of site operations from 1967 to 1977. The KDNREP first documented releases of hazardous substances in 1975, and in January 1979, the EPA responded to releases of oil and hazardous substances at the site. In 1980 the KDNREP contacted six responsible parties who identified and removed approximately 30% of the waste remaining on the surface of the site. In 1981 the EPA, upon inspection, discovered deteriorating and leaking drums and discharges of pollutants into the nearby creek. EPA conducted a removal action to upgrade the existing treatment system and remove the remaining 4,200 drums of surface waste offsite for recycling or disposal. There remains an unknown amount of waste buried onsite. The hazardous substances detected at this site include approximately 140 compounds of the following classes: heavy metals, ketones, phthalates, PCBs, chlorinated alkanes and alkenes, aromatics, chlorinated aromatics, and polynuclear aromatics (PAHs).

The selected remedial action for this site includes: removal of pond water; securing pond sediments, sludge and materials from low-lying areas beneath the cap; installing a final cap cover for containment of the waste materials; constructing a surface water drainage diversion to re-route surface water; and implementing a performance monitoring program to evaluate the effectiveness of the clay cap to mitigate surface chemical migration. The capital cost for the selected remedial alternative is estimated to be $795,349. O&M costs for this selected remedy were not specified.

PERFORMANCE STANDARDS OR GOALS: Specific performance goals not outlined in the ROD.

KEYWORDS: Ground Water; Heavy Metals; Inorganics; O&M; Organics; PAH; PCBs; PCEs; Sediments; Surface Water; Toluene; VOCs.

COLEMAN EVANS, FL
First Remedial Action - Final
September 25, 1986

The Coleman Evans Wood Preserving Company site is an active 11-acre wood preserving facility located in the town of Whitehouse, Duval County, Florida. The site consists of two distinct areas: the western portion, which comprises the wood treating facility; and the eastern portion, which consists of a landfill area which has been used for the disposal of wood chip and other wastes. Land use around the site is primarily residential and light commercial/industrial. Since 1954, Coleman Evans has produced wood products impregnated with PCP. Wastes from the process were discharged into an onsite drainage ditch, and two unlined sludge disposal pits. In 1980, ground water underneath the site was found to be contaminated. As a result, Coleman Evans constructed a closed-loop treatment system. In 1985, an Immediate Removal Action was taken to remove the contents of the two unlined pits. Subsequent site investigations confirm soil and ground water contamination, with PCP the primary contaminant of concern.

The selected remedial action for this site includes: all soils and sediments with PCP concentrations greater than 10 mg/kg will be excavated, approximately 9,000 cubic yards; excavated soils will be incinerated in a temporary onsite incineration unit. Decontaminated soils will be backfilled onsite; ground water recovery will be conducted for dewatering to facilitate excavation and to treat ground water with PCP concentrations greater than 1.01 mg/l. Recovered ground water will be stored and analyzed. If the level of PCP exceeds 1 ug/l, the ground water will be treated by an onsite carbon adsorption unit to a level below 1 ug/l PCP in accordance with Chapter 17-3.061.3(m) of the Florida Administrative Code before discharge to the surface water environment via the onsite drainage ditch. Other incidental Hazardous Substance List compounds identified in ground water during the implementation of this remedy will be cleaned up to levels which comply with Drinking Water Standards. Clean up compounds for which no standards exist will be to non-detection levels. The estimated capital cost for the remedy is $3,000,000 - $3,800,000 with no O&M costs.

PERFORMANCE STANDARDS OR GOALS: Excavation of all soils containing PCP >10 ppm. GW will be treated to levels which comply with Drinking Water Standards or Water Quality Criteria.

KEY WORDS: Alternative Technology; Drinking Water Standards; Excavation; Filling; Ground Water; Ground Water Treatment; Incineration; Oils; Organics; Phenols; Sediments; Soils; State Criteria; Water Quality Criteria.

DISTLER BRICKYARD, KY
First Remedial Action - Final
August 19, 1986

ROD ABSTRACT:

The Distler Brickyard site is located near the Ohio River, approximately one-half mile south of West Point, Kentucky and about 17 miles southwest of Louisville. The 3-acre site is located on a 70-acre abandoned brick manufacturing plant property, and portions of the site lie within the 50-year and 100-year flood plains of the Ohio River. The site consists of the brick complex and associated buildings, and an open field covered with grasses and shrubs. In 1976, Mr. Donald Distler leased the brickyard property from Mr. Thomas Hoeppner, the owner, and began disposing wastes from Distler's Kentucky Liquid Recycling, Inc. firm. In December of 1976, KNREPC learned of the disposal and conducted investigations at the site. These investigations led to Franklin County serving a restraining order to Mr. Distler to discontinue disposal of wastes at the site. Despite the order, disposal continued until January 1979, when KNREPC issued an order to abate operations. A partial removal of drums occurred, leading to later removal of 2,310 drums and visibly contaminated soil. Contents of the drums included liquids, sludges and solids found to be corrosive, volatile and flammable. The RI/FS, begun in April 1984, indicated 8,000 cubic yards of soil and ground water contamination in the site area. Primary contaminants of concern are VOCs including TCE, DCE, benzene and toluene; naphthalene; bis (2-ethylhexyl) phthalate; and heavy metals.

The selected remedial action for the site includes: excavation and offsite disposal of soils contaminated above background levels in areas A and B; backfill with "clean" natural granular soils; grade surface to existing grade and revegetate; and extraction and offsite treatment of contaminated ground water to background levels and reinjection into the aquifer. Estimated present worth cost of the remedy is $7,500,000 with O&M costs of $1,568,000 for years 1 and 2, and $44,000 for years 3-30.

PERFORMANCE STANDARDS OR GOALS: Excavation of all soils to background, treatment of ground water to background.

KEYWORDS: Background Levels; Excavation; Flood Plain; Ground Water; Ground Water Treatment; Heavy Metals; Inorganics; O&M; Offsite Disposal; Organics; Soil; TCE; Toluene; VOCs.

DISTLER FARM, KY
First Remedial Action - Final
August 19, 1986

ROD ABSTRACT

Distler Farm is located in the southwest corner of Jefferson County, KY, approximately one mile northwest of West Point, KY. The property is bordered by U.S. Highway 60/31 W (Dixie Highway) on the northwest; Stump Gap Creek on the southeast; and by cultivated farmland on the northeast and southwest. The site is a three-acre area approximately 1,000 feet from the Ohio River. The site was discovered in early 1977 during the development of an enforcement case against Mr. Donald F. Distler, owner of Kentucky Liquid Recycling, Inc. In an effort to locate sites that Mr. Distler may have used for chemical waste storage or disposal, EPA personnel inspected the site in April 1977. They reported approximately 600 drums of industrial waste stored on the ground surface. In December 1978 the Ohio River and its tributaries flooded, causing drums of industrial wastes from the site to be scattered along the flood plain of the creek. The Governor of Kentucky declared an environmental emergency and Region IV of the EPA supervised recovery and onsite storage of 832 drums containing chemicals characteristic of paint and varnish industry. The drums were later removed by the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC). During the cleanup effort U.S. Army personnel located four drum burial sites. Between January 1979 and April 1984, the EPA conducted various surface water, ground water, soil, sediment, and well studies. These studies confirmed the evidence of soil contamination and ground water contamination at the site. No significant site-related contamination appeared in surface waters, sediments or residential wells outside the property boundaries. Prior to the completion of the RI, contaminated soils were removed from the site and transported to permitted hazardous waste disposal facilities; airborne contaminants also are not a problem. Following the removal operations, the pits were backfilled, and the entire affected area was graded, cultivated, and sown with grass seed to control erosion. Surface storage and burial areas have been confirmed as being contaminated. These areas were considered to be the likely sources of potential future releases of contamination. The primary contaminants of concern include: VOCs, PCE, TCE, ketones, toluene, inorganics, radioactive material, and metals.

The selected remedial action includes: excavation and removal of all contaminated soils above background and offsite disposal in a hazardous waste landfill; backfilling with "clean" natural granular soils, extraction of contaminated groundwater and temporary accumulation and onsite storage; transportation of contaminated groundwater to offsite commercial facility and treatment to background levels; reinjection of uncontaminated water into the aquifer; and maintenance of vegetation, erosion repair, and ground water monitoring for a one year period. The capital cost is $11,138,400 with O&M in years 1-10 of $113,600 and $20,000 for years 11-30.

DISTLER FARM, KY
First Remedial Action - Final
(Continued)

PERFORMANCE STANDARDS OR GOALS: During excavation, periodic sampling will assume that when background levels are reached, excavation will cease.

KEYWORDS: Background Levels; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; Metals; Offsite Disposal; O&M; Organics; PCE; Soils; TCE; Toluene; VOCs.

GALLAWAY PONDS, TN
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT

The Gallaway Ponds site is located 2.3 miles northeast of Gallaway, Fayette County, TN. The site lies near the top of a low ridge composed mainly of gravel, sand, and clay terrace deposits. The ridge has been extensively mined for sand and gravel, producing a landscape dotted with water-filled pits up to 50 feet deep. The site encompasses the land area adjacent to and including nine ponds located within a currently inactive (5-acre) portion of a larger (50-acre) active sand and gravel operation. One pond, designated Pond 1, was used for the disposal of liquid and solid waste, including pesticides, glass jars containing solid waste, and drums. Some pits have been used for the disposal of residential trash, demolition debris, and appliances. Disposal of hazardous materials at the site occurred for an undetermined period of time, probably in the 1970s or early 1980s. Drums containing liquid waste were disposed of by emptying the drums into a small pond or by placing the entire drum into the pond. Small glass bottles containing "quality control" samples from pesticide blending operations were disposed of directly to the small pond. No disposal activities at this site have ever been permitted by State or local authorities. In October 1983, the EPA conducted an emergency cleanup of Pond 1, consisting of the excavation and offsite disposal of contaminated sludges and the onsite treatment of the water in the pond. The treated water was subsequently discharged to Ponds 2 and 3, located east of Pond 1. The primary contaminants of concern include: pesticides, inorganics, chlordane, and toxaphene.

The selected remedial action includes: excavation of 1,600 cubic yards of contaminated sediments from Ponds 2 and 5 with consolidation into Pond 1; proper site closure under Subtitle C of RCRA; dilution of water from Ponds 1,2, and 5 with city water to meet Ambient Water Quality Criteria and subsequent discharge to unnamed tributary; institutional controls which will be fully identified during remedial design; ground water monitoring; and inspection and maintenance of the cap. The estimated capital cost is $344,735 with 30-year O&M present worth costs of $163,265.

PERFORMANCE STANDARDS OR GOALS: Specific performance goals not outlined in the ROD.

INSTITUTIONAL CONTROLS: Those implemented will be fully identified during remedial design. They may include, but will not be limited to: fencing the remediated Pond 1 area; instituting a mining restriction on the remediated Pond 1 area; ensuring future land uses compatible with the remedy.

KEYWORDS: Excavation; Ground Water Monitoring; Inorganics; Institutional Controls; O&M; Onsite Disposal; Organics; Pesticides; RCRA Closure Requirements; Sediments; Soils; Surface Water.

HIPPS ROAD LANDFILL, FL
First Remedial Action - Final
September 3, 1986

ROD ABSTRACT

Hipps Road Landfill is located at the intersection of Hipps Road and Exline Road in Jacksonville Heights, Duval County, Florida. The area is a semi-rural residential neighborhood. Two homes are physically on the landfill and three other residences are immediately adjacent to it. The landfill is situated above the 500-year flood plain and there are no ecologically sensitive areas nearby. Surface water is not used to supply drinking water in the area, and recreational purposes consist of swimming, boating, fishing, and similar activities. Present lateral distance of ground water contamination extends approximately 1,000 feet northeast of the site. In 1968, the property owner, Mr. G. O. Williams (now deceased) contracted with Waste Control of Florida, Inc., a local disposal company, to fill in the site. No record of the fill material exists. Operations ceased in 1970 when a permit request to extend the landfill eastward was denied. Problems were first reported in the early 1970s when a pond adjacent to the landfill developed a thick, smelly film, and fish and nearby vegetation died. No record of action was noted. In February 1983 area residents began to complain of a foul odor and taste in the drinking water. Well sampling identified the presence of VOCs in the drinking water. During re-sampling studies in March, April and August 1983, larger suites of VOCs and metals were discovered. Between June and October 1983, the city installed waterlines supplying the site residents with city water. By January 1985 ground water was no longer a source for drinking water in the area. The primary contaminants of concern include: VOCs, TCE, metals, xylene, toluene, benzene.

The selected remedial action includes: ground water recovery and treatment at the POTW; landfill closure complying with Florida closure regulations; and institutional controls. The estimated cost for this remedy is $3.9-4.4 million. Capital and O&M costs were not specified separately, however, EPA will fund O&M activities for one year after completion of the remedial action. O&M will continue for 20 years using funds provided by the State of Florida.

PERFORMANCE STANDARDS OR GOALS: Contaminants will be recovered until the ground water quality is in compliance with the standards set forth under the Safe Drinking Water Act (SDWA). Contaminants not addressed under SDWA will be removed until compliance with the 1980 Water Quality Criteria Human Health Standards is reached. Where no standards exist, a cancer risk of 10^{-6} will be used as the clean-up target, however this will be redefined in the design phase.

INSTITUTIONAL CONTROLS: Controls will be fully identified during remedial design and may include, but will not be limited to: fencing the site; grouting existing private wells; instituting a well drilling ban which can be lifted at the conclusion of the 20-year monitoring period; acquiring affected properties under the policies and practices established by the Federal Emergency Management Agency (FEMA).

HIPPS ROAD LANDFILL, FL
First Remedial Action - Final
(Continued)

KEYWORDS: Drinking Water Contaminants; Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Metals; O&M; Organics; State Criteria; Surface Water; Toluene; VOCs.

HOLLINGSWORTH, FL
First Remedial Action - Final
April 10, 1986

ROD ABSTRACT

The Hollingsworth Solderless Terminal Company (HSTC) site is located in Fort Lauderdale, Broward County, Florida. The 3.5-acre site was in operation from 1968 until the company closed the facility on October 1, 1982. HSTC manufactured solderless electrical terminals. The manufacturing process included heat treatment in molten salt baths, degreasing, and electroplating. For approximately eight years, HSTC disposed of wash water and process wastewater contaminated with trichloroethylene (TCE), and/or heavy metals into drainfields adjacent to the manufacturing plant. Disposal practices at the site have been clearly documented; however, the amounts of TCE disposed of and the exact locations and duration of disposal remain undocumented. The waste TCE was used both as a degreasing solvent and for cleaning floors, equipment, etc. Primary contaminants at the site include TCE, vinyl chloride, trans-1,2-dichloroethene, and to a lesser extent, nickel, tin, and copper.

The selected remedial action for this site includes: excavation, aeration and onsite replacement of volatile organic contaminated soils; and recovery of contaminated ground water from the sand zones of the aquifer, with treatment and reinjection into the aquifer. The capital cost for the selected remedial action is estimated to be $653,730 with O&M costs approximately $364,215 per year.

PERFORMANCE STANDARDS OR GOALS: The cleanup goals for ground water remediation at the site were based on both the 10^{-6} cancer risk factor and the State of Florida primary drinking water standards. Ground water cleanup goals are: vinyl chloride 1.0 ug/l; trichloroethylene 3.2 ug/l; and trans-1,2-dichloroethene 70.0 ug/l. Soils remediation is expected to achieve: copper 10.0 mg/l; nickel 1.0 mg/l; lead 0.5 mg/l; and total VOCs 1.0 mg/kg.

KEYWORDS: Aeration; Air Stripping; Carcinogenic Compounds; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; Soil; TCE; VOCs.

LEES LANE LANDFILL, KY (EDD)
Second Remedial Action - Final
September 25, 1986

ROD ABSTRACT:

The Lees Lane Landfill (LLL) site is located adjacent to the Ohio River in Jefferson County, Kentucky. Land use at the site has included a sand and gravel quarry, a junkyard, and a landfill. The landfilling operations were reported to have begun in the late 1940s. The site received domestic, commercial, solid municipal, and at least 212,400 tons of mixed industrial waste (some drummed) prior to its closure in April 1975. In March 1975, homeowners in an adjacent community, reported flash fires around their water heaters. A subsequent investigation detected explosive levels of methane gas and seven families were evacuated from homes near the site. A venting system was installed in October 1980. In February 1980, the Kentucky Department of Hazardous Materials and Waste Management (HMWM) discovered approximately 400 drums about one hundred feet from the Ohio River bank. The drums were moved to an approved hazardous waste disposal facility by the LLL owners under court order in September and October 1981. The remaining nonhazardous drummed materials and empty drums were buried onsite. Surface water, soil, and ground water are contaminated with benzene, heavy metals including lead, arsenic, and chromium, and inorganics.

The selected remedy for this site includes: provision for a properly operating gas collection system; consideration of a possible future alternate water supply; cleanup of surface waste area which will involve removal of exposed drums, capping of "hot spot" soils and an area containing exposed trash, and disposal at an approved landfill; bank protection controls which will include the installation of riprap to minimize erosion potential and failure of the Ohio River embankment; establishment of an ACL for the ground water at the site; institutional controls, which will be fully identified during remedial design; and ground water, gas, and air monitoring. The estimated capital cost for this remedy is $2,343,000 with annual O&M costs of $127,440.

PERFORMANCE STANDARDS OR GOALS: The proposed monitoring systems will enable the establishment of an ACL for the site.

INSTITUTIONAL CONTROLS: Controls to be fully identified during remedial design may include, but will not be limited to, cautionary signs and the installation of a gate at the Putnam Street access point.

KEYWORDS: Alternate Concentration Level; Arsenic; Air Monitoring; Capping; Chromium; Excavation; Flood Plain; Ground Water Monitoring; Heavy Metals; Inorganics; Institutional Controls; O&M; PRPs; RCRA Part 264; Soil; Surface Water; VOCs.

MOWBRAY ENGINEERING, AL
First Remedial Action - Final
September 25, 1986

ROD ABSTRACT

The Mowbray Engineering Company (MEC) site consists of a 3-acre swamp located in Greenville, Butler County, Alabama. The study area evaluated in the RI/FS also included the MEC plant property located across the street from the swamp. The MEC site lies in the 100-year flood plain of the Tanyard Branch, and is saturated most of the year. An aquifer underlying the site supplies 11,400 residents with potable water. Since the early 1940s, MEC has been in the business of repairing electrical transformers. Waste oils generated from this process were dumped onto the ground behind the plant. Oil was also allowed to flow into a city storm sewer drain and ultimately into the swamp. Dumping and other discharges continued until the mid 1970s. A fish kill occurred in 1975 in Tanyard Branch. As a result, MEC installed two underground storage tanks to collect oil for resale and prevent future spills. In 1980 another fish kill occurred, and the State sampled soils to determine the exact source of contamination. PCBs were detected in swamp soils at 500ppm, leading to EPA removing the top six inches of swamp soil and disposing of the wastes in an approved offsite hazardous waste facility. The MEC site was listed on the NPL in 1982, and RI/FS activities were initiated in January, 1985, following discovery of PCBs in concentrations of 1,737ppm in 4,800 cubic yards of soils contained in the storm water drainage pathway. The primary contaminants of concern are PCBs.

The selected remedial action includes: excavation, removal and disposal of the underground storage tanks located on the MEC property; treatment or disposal of waste oils encountered in the swamp area and in the underground storage tanks by a TSCA-approved method; drainage diversion of surface runon around the swamp area; excavation of soils contaminated above 25ppm PCBs and either offsite or onsite incineration, or onsite stabilization/solidification of these soils. Infrared incineration is preferred, but if operating parameters deem this technology impractical, solidification/stabilization will be performed. The remedy also includes grading and revegetating the swamp; proper closure of the abandoned onsite city supply well in accordance with Alabama Department of Environmental Management well closure regulations; and O&M involving maintenance of the drainage diversion ditch, the revegetated area and possibly the solidified matrix. Estimated capital cost of the remedy is $1.2-2.0 million for offsite incineration, $1.1-1.8 million for onsite incineration, and $750,000 for solidification/stabilization. O&M costs are included in the capital cost estimates.

PERFORMANCE STANDARDS OR GOALS: All soils contaminated with PCBs above 25ppm will be excavated and treated.

KEYWORDS: Alternative Technology; Excavation; O&M; Oils; PCBs; Soil; TSCA Requirements.

PEPPER'S STEEL, FL (EDD)
First Remedial Action - Final
March 12, 1986

ROD ABSTRACT

The Pepper's Steel and Alloys site occupies 30 acres known as Tracts 44, 45, and 46 in the Town of Medley, Florida. Medley is located in northern Dade County, approximately 10 miles northwest of Miami and 13 miles inland from the Atlantic Ocean. Additionally, the Pepper's Steel site is located in the "unsewered industrial area" and near three other Superfund sites referenced in the Biscayne Aquifer ROD. Since the mid-1960s the Pepper's Steel site has been the location of several businesses, many of which are still operating onsite. Operations have included the manufacture of batteries, pre-cast concrete products and fiberglass boats, as well as the repair and service of trucks and heavy equipment. Also, sandblasting and painting services, a concrete batching plant and an automobile scrap operation have been or are located on the site. Various trash and waste products from these activities, including parts of rusted machinery, vehicles, aircraft, oil tanks, transformers, underground storage tanks and batteries have been deposited at the site. The contaminants that have been identified within the soil, sediments, and ground water in and around the site include PCBs, organic compounds and heavy metals such as: lead, arsenic, cadmium, chromium, copper, manganese, mercury, zinc, and antimony.

The selected remedial action for this site includes: collection and offsite disposal of all free oil according to TSCA regulations; excavation of approximately 48,000 cubic yards of soils exceeding 1 ppm PCB, 21,500 cubic yards exceeding 1,000 ppm lead, and 9,000 cubic yards exceeding 5 ppm arsenic; solidification/stabilization of these soils with a cement-type mixture and placement onsite; institutional controls to ensure future land uses compatible with the remedy; and ground water monitoring to ensure the effectiveness of the remedy. Total capital cost for the selected remedial alternative is estimated to be $5,212,000 with O&M costs approximately $42,500 per year.

PERFORMANCE STANDARDS OR GOALS: Excavation of soils exceeding 1 ppm PCB, 1,000 ppm lead and 5 ppm arsenic.

INSTITUTIONAL CONTROLS: Institutional controls will be implemented to ensure future land uses compatible with the remedy.

KEYWORDS: Alternative Technology; Arsenic; Chromium; Ground Water; Ground Water Monitoring; Heavy Metals; Institutional Controls; Offsite Disposal; Organics; PCBs; Sediments; Soil; Solidification; Stabilization.

PIONEER SAND, FL
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT

The Pioneer Sand site, owned by the Pioneer Sand Company (PSC), is an inactive 11-acre quarry located near Belleview, FL. A disposal permit was granted to PSC in 1974 which allowed the disposal of inert materials including construction debris and shredded automobile strippings. Between 1974 and 1978, phenols and resin compounds were deposited from Newport Industries (currently Reichhold Chemical Company). Domestic and industrial wastes including metal plating sludges were also received from the Pensacola Naval Air Station. Approximately 75 percent of the site is an excavation pit, while the remaining 25 percent is a fill area consisting of the above-mentioned materials. In 1981 the Florida Department of Environmental Regulation did not renew the disposal permit and ordered the waste dumping practices to cease. Based on the RI results for PCB analysis of soils at the site, the EPA conducted an Immediate Removal Action in August 1986. All known areas of PCB concentrations greater than 50 ppm were removed. The primary contaminants of concern include: VOCs, organics, heavy metals, phenols, phthalates, and toluene.

The selected remedial action for the site includes: RCRA Subtitle D landfill closure; leachate collection, treatment, and onsite disposal; surface water treatment and onsite discharge; and cover system for sludge pond waste. The estimated capital cost is $462,025 with O&M costs of $45,000 for the first year, and $34,900 for years 2-30.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEY WORDS: Ground Water Monitoring; Heavy Metals; Inorganics; Leachate Collection/Treatment; O&M; RCRA Landfill Specifications; RCRA Part 264; Sludge; Soil; Sole-Source Aquifer; Surface Water; VOCS.

SCRDI DIXIANA, SC
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT

The SCRDI Dixiana site consists of a 2-acre lot and a warehouse in southeastern Lexington County, South Carolina. The warehouse, located near the center of the property is an abandoned one-story, metal structure. The predominant land use in the areas adjacent to the site are woodlands and light residential development. Approximately 1,193 people use water supply wells within three miles of the site. South Carolina Recycling and Disposal, Inc. (SCRDI) leased the site from G.M.T. in 1978 for drum storage of industrial wastes. Instances of poor handling practices, leaky drums, and exposure to the weather allowed numerous discharges to the environment prior to drum removal. In August 1978 a waste management permit was denied to SCRDI by the South Carolina Department of Health and Environmental Control (SCDHEC) because of poor waste management practices. A suit was filed by SCDHEC against SCRDI during the same month. Removal of all surficial drummed waste and visibly contaminated soils was performed by SCRDI. The Ground Water Protection Division of SCDHEC completed a detailed ground water monitoring program in Autumn 1982 and confirmed ground water contamination underlying the site. No significant site-related surface water, sediment, air, or surface and subsurface soil contamination have appeared. Potential sources of future contamination at the site are former drum storage areas and suspected spill areas. Contamination is presently moving offsite primarily via shallow ground water in response to the hydraulic gradients in various interconnected aquifers. The primary contaminants of concern include: VOCs, PAHs, PCBs, PCE, organics, pesticides, inorganics.

The selected remedial action includes: extraction of contaminated ground water; treatment of contaminated ground water to alternate concentration levels (targeted at a 10^{-6} clean-up level); discharge of treated ground water to surface water (regulated by South Carolina's NPDES Discharge Permit); and no action on soils. The estimated capital cost for this remedial action is $751,250 with O&M estimated at $2,128,100 for a 30-year period. O&M may require anywhere from 3 years to 30 years to accomplish.

PERFORMANCE STANDARDS OR GOALS: Will conduct extraction and treatment of ground water contamination to attain a health-based alternate concentration level (ACL) for the combination of all effluent compounds from the treatment system for a cumulative cancer risk of 1.0×10^{-6}.

KEYWORDS: Alternate Concentration Level; Ground Water; Ground Water Treatment; Inorganics; Onsite Disposal; O&M; Organics; PAHs; PCBs; PCE; Pesticides; State Regulations; VOCs.

SAPP BATTERY, FL
First Remedial Action - Final
September 26, 1986

The Sapp Battery site occupies an area of approximately 45 acres in a rural part of Jackson County, Florida. Located on the site are two ponds, connected by a small channel. In 1970, Sapp Battery Service, Inc. began an operation to recover lead from used batteries. The process consisted of breaking open used batteries, dumping the acid outside the plant, recovering the lead, and disposing of the broken battery casings in an onsite man-made fishing pond. In 1977 the acid discharge began killing nearby cypress trees. Sapp Battery subsequently undertook several steps to alleviate the problem, all of which failed. In 1980, Mr. Jerry Sapp, owner of Sapp Battery, closed operations and, in effect, walked away from the site. The RI/FS conducted at the site revealed surface water, ground water, 94,000 cubic yards of soil, and 20,000 cubic yards of sediments contaminated with lead, cadmium, arsenic, antimony and other heavy metals.

The selected remedial action for this site includes: excavation of soils and sediments containing contaminant levels above those set in the Risk Assessment; fixation of the excavated soils/sediments and onsite disposal of the solidified matrix into a cell built to Florida Class I Sanitary Landfill Standards; groundwater removal and treatment of the underlying aquifers; treatment and discharge of contaminated surface water from the onsite swamp and the offsite Steele City Bay area; and monitoring program for potable water wells located within a one-mile radius of the site. Needed institutional controls will be assessed and implemented during the Remedial Design/Remedial Action (RD/RA) phase of the project. Estimated capital cost of the selected remedy is $14,318,544 with annual O&M costs of $25,631.

PERFORMANCE STANDARDS OR GOALS: Cleanup criteria for indicator chemicals were set based on Federal and State Standards and risk-based levels.

INSTITUTIONAL COST: Needed institutional controls will be assessed and implemented during the RD/RA phase of the project.

KEY WORDS: Alternative Technology; Arsenic; Excavation; Ground Water; Ground Water Monitoring; Ground Water Treatment; Heavy Metals; Institutional Controls; O&M; Onsite Disposal; Sediments; Soil; Solidification; Surface Water.

A&F MATERIALS, IL
Second Remedial Action - Final
August 14, 1986

ROD ABSTRACT:

The A&F Materials site is located on three and three-quarter acres in Greenup, IL. The site, originally an undeveloped backwater flood zone for the Embarras River, was first developed for a sawmill operation. Mr. Ken Ault purchased the site for the A&F Materials recycling plant, which began operations in March 1977 and continued until it shut down in 1980. The plant processed waste materials (including, but not limited to, oil, sludge, caustic and sulfuric acid) into fuel oil and fire retardant chemicals. During the course of operations, there were numerous violations of the operating permit issued to the plant by the IEPA. By March 1978, four storage lagoons became filled and began to overflow, contaminating the soil and drainage pathway. In addition, thirteen steel storage tanks containing a mixture of waste oils (contaminated with PCBs and organics), sludges, spent caustics and acids, contaminated water and other waste products, were located onsite. The tanks had failed on several occasions, releasing their contents. In March 1980, May 1982, and December 1982, actions were taken at the site to lower the immediate potential of releases. These actions included lowering the level of wastes in the lagoons, diking, trenching, cleanup and removal of on- and offsite wastes. In addition, a temporary cap was placed on the consolidated sludge in March 1983. In September 1984, the Aluminum Company of America, Northern Petrochemical, CAM-OR Inc. and Petrolite Corporation entered into a Partial Consent Decree (PCD) whereby the Companies agreed to undertake surface cleanup at the site as an additional removal and remedial action. Pursuant to this PCD, an RI/FS was prepared by the Consenting Defendants which determined the amount of soil/sludge to be removed and the extent and flow direction of ground water contamination. Following the soil removal in 1985, only phenols and benzoic acid were detected above the non-detectable limits. The most significant contaminants of concern found during the RI/FS include: sulfates, inorganics, PCBs, TCE, and metals.

The selected remedial action for the site includes: ground water monitoring of the natural purging and dilution of contaminants; institutional controls; and establishment of procedures for regular review of monitoring data. There is no estimated capital cost associated with this remedy, however, the PRPs have agreed to pay the estimated annual O&M costs of $24,000.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

INSTITUTIONAL CONTROLS: Institutional restrictions on the installation of wells in the contaminated ground water region will be required until ground water quality returns to background levels or below State and Federal criteria.

KEYWORDS: Flood Plain; Ground Water; Ground Water Monitoring; Inorganics; Institutional Controls; Metals; O&M; Organics; PCBs, PRP; State Standards; TCE; VOCs.

ARCANUM IRON AND METAL, OH
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT

The Arcanum Iron and Metal (AIM) site is a 4.5 acre site located in Twin Township, Darke County, OH just southeast of the city of Arcanum and 25 miles northwest of Dayton. The AIM site operated as a lead battery reprocessing facility from the early 1960s until 1982. During this operation, battery casings were split to extract lead cores for smelting. Battery acids generated from this operation were dumped in a large steel trough and allowed to drain to a low area. Reprocessing of the plastic and black rubber battery casings generated lead oxide sludge and lead particulates which collected on the ground surface and surface ponds onsite. Past practices at the facility included burial of some materials in onsite pits. Results of the surface soil and soil boring samples taken during the RI indicate that lead is the primary contaminant of concern with antimony and arsenic leading the contaminants of secondary concern. Lead was detected in on- and offsite monitoring wells but not in the six offsite residential wells sampled. Lead contamination was also found in on- and offsite surface water and sediments and three onsite buildings. In addition, an estimated 3,800 cubic yards of shredded battery casings exist onsite.

The cost effective remedy selected includes: removal of 20,000 cubic yards of onsite contaminated soils to 500ppm lead and disposal in offsite RCRA Subtitle C landfill; removal of offsite soils to background lead concentrations and disposal of soils above 500ppm in offsite RCRA Subtitle C landfill and soils between background and 500ppm onsite; continued ground water monitoring semiannually; improvement of site drainage; removal of 3,800 cubic yards of battery casings, conduction of treatability studies, and placement in RCRA Subtitle C landfill; cleaning or demolishing contaminated onsite facilities; and deed restrictions on site land use and aquifer use in the affected areas. Total capital cost of the selected alternative is estimated to be $9,929,000 with annual O&M costs approximately $37,000.

PERFORMANCE STANDARDS OR GOALS: Excavate and dispose in offsite RCRA landfill all on- and offsite soils with lead concentrations above 500ppm. Offsite soils with lead concentrations between background and 500ppm disposed onsite. These levels were based on CDC Acceptable Daily Intake Levels (ADIs).

INSTITUTIONAL CONTROLS: Deed restrictions on site land use and aquifer use in the affected areas.

KEYWORDS: Antimony; Aquifer Use Restrictions; Arsenic; Deed Restrictions; Excavation; Ground Water; Ground Water Monitoring; Heavy Metals; Institutional Controls; O&M; Offsite Disposal; Onsite Disposal; Sediments; Soil; Surface Water; Treatability Studies.

ARROWHEAD REFINERY, MN
First Remedial Action - Final
September 30, 1986

ROD ABSTRACT:

The Arrowhead Refinery site is located in Hermantown, St. Louis County, Minnesota. The site consists of 10 acres of relatively flat land with peaty wetlands scattered across the area, and it is zoned for commercial use. Land use in the vicinity is a combination of residential, commercial and public. Between 1945 and 1977, the site was used as a waste oil reclaiming facility. The operation generated waste by-products which were discharged into an uncontained 2-acre lagoon and a waste water ditch in a wetland area. Arrowhead Refinery Company, incorporated in 1961, continued refining and recycling operations until 1977, when the Minnesota Pollution Control Agency ordered work to be stopped. Investigations conducted by EPA in 1979 revealed that onsite surface water was transporting contaminants to nearby wetlands areas and navigable waters. In response, a surface water diversion ditch was constructed to prevent further contaminant migration. The primary contaminants of concern are VOCs, PAHs and lead, and they are found in onsite soils, sediments, surface waters and ground water.

The selected remedial action for the Arrowhead Refinery site includes: excavation and onsite incineration of 4,600 cy of sludge and 20,500 cy of contaminated soils and sediments; ground water pumping and treating designed to restore the aquifer and control contaminant migration over a 25-50 year period; extension of a nearby municipal water supply system to replace those private water supplies most likely to be affected by ground water contamination; and proper abandonment of individual wells formerly used as drinking water supplies in accordance with State well codes. Estimated capital cost of the remedy is $22,000,000 with annual O&M costs ranging between $130,000 and $180,000.

PERFORMANCE STANDARDS OR GOALS: Soils and sediments will be excavated and treated to achieve a 10^{-6} excess cancer risk level; GW will be treated to remove VOCs, PAHs and lead until aquifer attains a 10^{-6} excess cancer risk level.

INSTITUTIONAL CONTROLS: Potentially affected wells will be abandoned in accordance with State well codes.

KEYWORDS: Alternate Water Supply; Alternative Technology; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Treatment; Incineration; Institutional Controls; O&M; Organics; PAHs; Sediments; Sludge; Soil; Surface Water; Wetlands; VOCs.

BURLINGTON NORTHERN, MN (EDD)
First Remedial Action - Final
June 4, 1986

ROD ABSTRACT:

The Burlington Northern (BN) site is located in both the City of Baxter and the City of Brainerd, MN. The Mississippi River flows about 3,000 feet east of the plant and residential areas are located to the northeast and southeast, less than 1,000 feet from the site. Since 1907, BN has owned and operated the railroad tie treatment plant on this site. During the 1950s BN began mixing creosote, a preserver, with Number 5 fuel oil in a 1:1 ratio. At some undetermined time, the mixture was changed to creosote and coal tar. This mixture is presently being used in a 70:30 ratio. Wastewater generated from the wood treating process was sent to two shallow, unlined surface impoundments for disposal. The discharge of wastewater to the disposal ponds generated a sludge that contaminated 9,500 cubic yards of both the underlying soils and ground water. Ground water contamination is restricted to a relatively small area downgradient from the site. The primary contaminants of concern include: PAHs, heterocycles, and phenols.

The selected alternative for this site consists of onsite treatment and capping. The major components of the alternative include: preparation of a lined staging area for temporary storage of the sludge and contaminated soil; removal of all standing water in the impoundment; excavation and segregation of the sludges for subsequent free oil recovery; excavation of visibly contaminated soil from both impoundments and subsequent storage in the staging area; backfilling of the excavated areas; preparation of a base for the treatment area; installation of a sump for collection of the storm water and leachate; installation of an irrigation system; land treatment of creosote focusing on the breakdown and transformation of organic constituents by aerobic microorganisms in the top layer of soil, and the immobilization of organic and inorganic constituents on the soil. The final goal of this treatment is not the complete degradation of all waste constituents, but is rather the transformation and immobilization of these constitutents to render soil that is no longer toxic and does not leach harmful constituents. A final RCRA approved cover will be installed following the treatment process. The estimated capital cost for this remedy is $582,000 with annual O&M costs of $36,000.

PERFORMANCE STANDARDS OR GOALS: Action levels for ground water are consistent with monitoring limits: 28ng/l for the sum of carcinogenic PAHs and heterocycles; and 300ng/l for the sum of non-carcinogenic PAHs and heterocycles. Action levels for biodegration were not discussed in the ROD. Morever, the goal of treatment is to transform and immobilize contaminants to render soil that is no longer toxic and does not leach hazardous constituents. This involves achieving detoxification of soils as defined by the microtox test; and achieve total PAH and benzene extractable concentrations in the treatment zone equal to or less than concentrations present in soils left in place.

BURLINGTON NORTHERN, MN (EDD)
First Remedial Action - Final
(continued)

KEYWORDS: Alternative Technology; Capping; Creosote; Excavation; Ground Water; Ground Water Treatment; Leachate Collection System; O&M; Onsite Treatment; Organics; PAHs; RCRA Part 264; RCRA Closure Requirements; Sludge; Soil.

BURROWS SANITATION SITE, MI
First Remedial Action - Final
September 30, 1986

ROD ABSTRACT

The Burrows Sanitation site is a ten-acre site located on 54th Avenue in Hartford Township, Van Buren County, Michigan. This site was used for dewatering and disposing of metal hydroxide sludges, waste coolants, and soluble oils. Located within a three-quarter mile radius of the site are approximately 150 people living in thirteen permanent residences and a trailer park. These homes obtain water from private wells. Access to the site is restricted by a snow fence, but some sections of the fence are in poor condition, allowing sportsmen and skiers easy access. Two wetland areas, the East Wetland and the Northwest Wetland, are located on the eastern and northwestern edges of the site. The Northwestern Wetland was created artificially by the construction of an earthen dam. In July 1984, under a CERCLA Administrative Order by Consent, responsible parties excavated and removed sludges and contaminated soils from four onsite waste disposal areas. Sampling of these areas indicates that the former source materials were removed so they no longer present a potential health threat via direct contact or ingestion. Wastes similar to the excavated wastes remain in the newly identified Spill Area No. 2. Principal contaminants include chromium, copper, lead, nickel, zinc, and cyanide. Test results also indicate that the surface water and sediments in the Northwest Wetland and drainage canal have been impacted by the site. In addition, onsite monitoring wells indicate a limited chemical plume or plumes related to site activities. Residential wells in the site vicinity have not been impacted by site contaminants.

The cost-effective remedial action selected for this site includes: purge and treat the contaminated ground water for approximately 3 years, drain the artificial Northwest Wetland; remove and treat approximately 250 cubic yards of metal hydroxide sludge from Spill Area No. 2 and the Northwest Wetland; and dispose the treated waste at an offsite RCRA facility. Total estimated capital cost for the selected remedial action ranges from $1,256,700 to $1,335,400 depending on the distance to the offsite RCRA facility with O&M costs of $115,000.

PERFORMANCE STANDARDS OR GOALS: Ground water cleanup will be based on the current lowest regulated concentration for each indicator chemical. Criteria will be taken from the Safe Drinking Water Act Standards or Criteria, Acceptable Chronic Intake Levels, and Health Advisories. The cleanup criteria for residual soil contamination are based on the site-specific Endangerment Assessment.

KEYWORDS: Alternative Technology; Chromium; Drinking Water Standards; Excavation; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; Offsite Disposal; O&M; Plume Management; RCRA; Sediment; Sludge; Soil; Solidification; Surface Water; Wetlands.

BYRON JOHNSON SALVAGE YARD, IL
Second Remedial Action
September 23, 1986

ROD ABSTRACT:

The Byron Johnson Salvage Yard is an approximately 20-acre wooded parcel located in Ogle County, Illinois. General rubble and domestic refuse, along with industrial wastes including drums and plating materials, are scattered about this presently inactive site. During the 1960s and early 1970s, the yard operated as a salvage yard and unpermitted landfill. A March 1985 Record of Decision (ROD) implemented a remedial action consisting of excavation and removal of containerized waste and contaminated soil, and onsite treatment of soil containing excessive levels of cyanide. Ground water under and downgradient from the site is contaminated with heavy metals, cyanide and VOCs, including TCE and PCE. Because the material within the Salvage Yard has not yet been removed, wastes still present, both on the surface and buried, act as an ongoing source for ground water contamination.

The selected remedy for this second operable unit includes: installation of whole house carbon filtration systems in affected year-round residences to provide an interim alternate water supply; provision of an interim alternate water supply to residents occupying seasonal (summer-use) homes through distribution of bottled water; ongoing sampling and monitoring program to evaluate the effectiveness and lifetime of the carbon filters; installation of replacement filters after breakthrough occurrence; and disposal of spent filters in accordance with provisions of the Resource Conservation and Recovery Act of 1976, as amended. The IEPA has advocated the selection of the water line alternative and not the selected remedy even though the U.S. EPA considered the water line remedy to be potentially inconsistent with the final ground water remediation program. Because of the State's commitment to provide a permanent water supply, implementation of the ROD recommended alternative is not required to alleviate the current health threat and will not be funded unless the State of Illinois agrees to assume O&M costs and the 10 percent funds match. The estimated capital cost for this remedy is $115,500 with annual O&M estimated to be $165,350.

PERFORMANCE STANDARDS OR GOALS: Quantitative performance standards were not outlined in the ROD. However, remedy will comply with the 10^{-6} cancer risk levels for the suspected carcinogens.

KEYWORDS: Alternate Water Supply; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Heavy Metals; O&M; PCE; TCE; Temporary Remedial Measure; VOCs.

FIELDS BROOK, OH
First Remedial Action
September 30, 1986

ROD ABSTRACT

Fields Brook is located in the City of Ashtabula, Ohio and drains a 5.6-square mile watershed (defined as the "site"). The 3.5 mile main channel of Fields Brook flows through an industrial area that is one of the largest and most diversified concentrations of chemical plants in Ohio. The brook empties into the Ashtabula River which subsequently flows into Lake Erie 8,000 feet downstream of its confluence with Fields Brook. Industrial sources have contaminated the sediment in Fields Brook with a variety of organic and heavy metal pollutants, including TCE, PCE, chlorobenzene, vinyl chloride, arsenic, zinc, mercury and chromium. Base-neutral compounds including hexachloroethane, toluenediamine and toluene diisocyanate also have been detected in Fields Brook sediments. Sediments taken from the Ashtabula River in the vicinity of Fields Brook are contaminated with PCBs. The U.S. EPA believes that the amount of contamination entering the brook at this time has been substantially reduced due to the recent development of pollution control laws and discharge permitting requirements.

The selected remedial action for the Fields Brook site includes: excavation of contaminated sediment from Fields Brook, temporary storage and dewatering, thermal treatment of a portion of the wastes, and solidification and onsite landfilling of the remainder. Based on criteria presented in the ROD, approximately 36,000 cy of contaminated sediments will be solidified, and 16,000 cy will be thermally treated. The remedy also includes treatment of waste water from the dewatering process, and provision of O&M costs for one year. The estimated capital cost of the remedy is $35,100,000 with annual O&M costs of $72,000.

PERFORMANCE STANDARDS OR GOALS: Sediments will be excavated to a 10^{-6} excess lifetime cancer rate or background, whichever is greater.

KEYWORDS: Alternative Technology; Arsenic; Excavation; Heavy Metals; Incineration; O&M; Onsite Disposal; Organics; PCBs; PCE; RCRA Landfill Specifications; Sediments; Solidification; TCE; TSCA Onsite Disposal Requirements; VOCs.

FOREST WASTE, MI
Second Remedial Action
June 30, 1986

ROD ABSTRACT

The Forest Waste Disposal Site is located at 8359 East Farrand Road, Otisville, Michigan, approximately 12 miles northeast of Flint, and approximately 2 miles northwest of the City of Otisville. The total site area is approximately 112 acres. The site has a landfill with a surface area of approximately 15 acres, and nine surface impoundments with a collective surface area of approximately one acre. From 1973 to 1978, the site received general refuse, industrial and liquid waste, PBBs, and PCBs. Drummed wastes from various sources were disposed of in the landfill area, and waste oils, metallic sludges, paint and resin wastes, and spent sulfuric acid were disposed in the onsite lagoons. Currently, onsite soils and sediments are contaminated with priority pollutant compounds and various organic and heavy metal compounds.

The selected source control remedial alternative includes excavation, treatment and disposal of 4000 yd^3 of contaminated sludges, sediments and soils in an offsite RCRA-permitted landfill; and removal, treatment and disposal of 110,000 gallons of aqueous lagoon wastes at a RCRA treatment facility. The estimated capital cost for this remedy is $1,295,000 with no annual O&M costs.

PERFORMANCE STANDARDS OR GOALS: Cleanup will be conducted to levels which will obtain an appropriate ingestion rate of 0.1 gram/day of soil for a 70 kg adult.

KEYWORDS: Acids; Alternative Technology; Excavation; Ground Water; Heavy Metals; Inorganics; Offsite Disposal; Oils; PCBs; Sediments; Sludge; Soil; Solidification.

LAKE SANDY JO, IN
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT:

The Lake Sandy Jo site is located on the southeast side of the City of Gary in Lake County, Indiana. The site was a former 40-acre water-filled borrow pit that was used as a landfill between 1971 and 1980. Various wastes including construction and demolition debris, garage and industrial wastes, and drums are believed to be in the site. The area surrounding the site is primarily low density residential property. The borrow pit on the site was originally dug to support construction of I-90/84, which is adjacent to the site. In 1971 the pit was filled with ground water and was used for a short time as a recreational lake. Between 1971 and 1975 the pit was filled with various debris. Complaints were filed by local residents about odors emanating from the site, and in 1976 the owners were ordered to drain the lake and restrict fill to demolition debris only. Later in 1976 the site was sold to Glen and Gordon Martin, who continued filling operations without a permit until the site was closed in 1980. Approximately 2,500 cubic yards of surface soils, surface water and offsite sediments are contaminated by surface water runoff with PAHs, phthalates and heavy metals.

The selected remedial action for this site includes: installation of a soil cover over the landfill with a drainage blanket to control surface seeps; extension of water mains to affected residents in Gary; onsite consolidation of contaminated sediments; ground water and surface water/sediment monitoring; deed restrictions on landfill property; and institutional controls on aquifer use. The estimated capital cost of the remedy is $4,747,000 with annual O&M costs of $63,000.

PERFORMANCE STANDARDS OR GOALS: Sediments with contaminants above a 10^{-6} excess cancer risk level will be excavated.

INSTITUTIONAL CONTROLS: Institutional controls will prohibit use of ground water and installation of wells in the affected area, and deed restrictions will attempt to prevent future development of the site and prevent direct contact.

KEYWORDS: Alternate Water Supply; Deed Restrictions; Drinking Water Contaminants; Excavation; Ground Water; Ground Water Monitoring; Heavy Metals; Inorganics; Institutional Controls; O&M; Onsite Containment; PAHs; RCRA Closure Requirements; Sediments; Soil.

LASALLE ELECTRICAL, IL
First Remedial Action
September 29, 1986

ROD ABSTRACT:

The LaSalle Electrical Utilities (LEU) site is located in west-central LaSalle County in the city of LaSalle in north-central Illinois. There are approximately 190 people and 70 residences located within 1/8 mile of the LEU property. LEU, a former manufacturer of electrical equipment, began operating prior to World War II. Between the late 1940s and 1978, PCBs were utilized in the production of capacitors. Undocumented reports allege the application of PCB-contaminated waste oils as a dust suppressant both on and off the property until as late as 1969. Following the regulation of PCBs, manifests document the disposal of PCBs at all regulated facilities. Beginning in September 1975, numerous government agencies conducted various inspections and issued numerous complaints and orders to the LEU company as a result of its manufacturing and handling practices. Soil sampling conducted by the Illinois Environmental Protection Agency (IEPA) in December 1980 documented onsite PCB contamination. Continued soil sampling revealed offsite contamination in March and May 1981 and the IEPA ordered the company to cease operations in May 1981. The U.S. EPA conducted Immediate Removal Actions that involved fencing the LEU property and capping a portion of the heavily contaminated onsite property; capping contaminated offsite property to the south of the site; and staging, sampling and packaging PCB waste material for future disposal. Of the total 28,690 cubic yards of soil contaminated above 5ppm, approximately 22,240 cubic yards are offsite on the commercial property immediately to the south and residential property to the east of the site with approximately 27 affected property owners. The primary contaminant of concern is PCB.

The selected remedial action for this site includes: excavation of approximately 25,530 cubic yards of contaminated residential offsite soil and replacement with clean fill; incineration of contaminated soils with a transportable, onsite, thermal destruction unit; and conventional industrial cleaning, which would include vacuuming, hand washing, steam jet cleaning, and adsorption of all structures where soil removal activities have taken place. The estimated present worth cost is $26,400,000 with no annual O&M costs.

PERFORMANCE STANDARDS OR GOALS: Excavation and incineration of soils with greater than 5 ppm PCBs in the first 12 inches of soil, and greater than 10 ppm in soils at depths below 12 inches.

KEYWORDS: Alternative Technology; Excavation; Incineration; Onsite Disposal; PCBs; Soil.

METAMORA LANDFILL, MI
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Metamora Landfill site is located in Metamora Township, Lapeer County, MI. The 80-acre landfill was previously used for gravel mining and in 1966 as a privately owned, unregulated dump. In 1969 it was upgraded to meet existing standards, and licensed to receive general refuse. The site accepted both municipal and industrial waste until its closure in 1980. While undocumented, it is likely that the previous owner disposed of waste and drums in unlined excavations (former mining pits or borrow areas). In 1981 approximately eight drums were discovered during borrow excavations for a nearby solid waste transfer station. The Michigan Department of Natural Resources (MDNR) sampled seven of these drums and identified the presence of VOCs, and other organics. A 1982 MDNR study concluded that as many as 35,000 drums, some containing liquid waste, might be present in five disposal areas around the site. The survey concluded that area one (16,000 drums) and area four (10,000 drums) contained about 74% of the total estimated number of burial drums. While each of the five disposal areas was initially considered, areas two, three, and five were eliminated due to the inability to confirm drum presence at inaccessible depths. Remedial actions for ground water, which poses a public health threat, and soil have not been addressed due to insufficient data detailing the extent of contamination. Based on an estimated 26,000 drums and associated waste material between drums in areas one and four, the total estimated waste volume requiring disposal is 18,150 cubic yards. The primary contaminants of concern include: VOCs, PCE, TCE, and heavy metals.

The recommended alternative for this operable unit is the excavation of areas one and four, and thermal destruction of all waste at a compliant RCRA offsite incinerator. The estimated 30-year present worth cost is $41,500,000.

PERFORMANCE STANDARDS OR GOALS: The RI/FS to be completed in FY'88 will establish cleanup targets for the soil and ground water. The recommended alternative fully complies with all applicable State and Federal statutes.

KEYWORDS: Excavation; Ground Water; Heavy Metals; Incineration; Offsite Disposal; RCRA; PCE; Soil; TCE; VOCs.

NEW BRIGHTON/ARDEN HILLS/ST. ANTHONY, MN
Fourth Remedial Action
June 30, 1986

ROD ABSTRACT

The New Brighton/Arden Hills/St. Anthony site is located approximately two miles north of the Twin Cities of Minneapolis/St. Paul, Minnesota, and is one of several communities in the area which obtains its municipal water supplies entirely from ground water resources. In June 1981, the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) detected organic solvent contamination in the ground water used for municipal drinking water in New Brighton. Prior to these findings, the City of New Brighton had constructed and operated a total of nine municipal wells. From 1982 to 1984 the City shut down six wells (1 to 6), deepened two municipal wells (8 and 9) to the Mt. Simon-Hinckley aquifer and constructed three new wells (10, 11 and 12). These new wells were also finished in the Mt. Simon-Hinckley aquifer. Of the original municipal wells completed in the Prairie du Chien-Jordan aquifer, only well 7 presently shows minimal contamination. During this same period, several Initial Remedial Measures (IRMs) were implemented at the site. In 1983, granular activated carbon filters were installed on two of New Brighton's wells (5 and 6) to meet peak summertime demands. In addition, pipeline connections to New Brighton's and Arden Hills' water mains were made for several private well users whose wells had excessive levels of contamination. Finally in 1984, the City of St. Anthony, which is immediately south of New Brighton, received a temporary water connection to the City of Roseville. This State-lead IRM was necessary because the City of St. Anthony was experiencing water shortages due to the contamination and subsequent closure of one of their three Prairie du Chien-Jordan aquifer municipal wells. Contamination is now being detected in the remaining two municipal wells and a Phased Feasibility Study (PFS) is currently being conducted for the City's water supply.

The selected remedial action for this site includes the construction of a new well into the Mt. Simon-Hinckley aquifer system to replace New Brighton well 7. Total capital cost for the selected remedial alternative is estimated to be $600,500 with O&M costs approximately $22,820 per year. MPCA is continuing its comprehensive remedial investigation/feasibility study (RI/FS) for the site. A preliminary RI characterizing the site, major migration pathways, and preliminary identification of significant sources has already been completed. MPCA is planning to complete the remaining tasks of the comprehensive RI/FS in 1988 in order to evaluate potential final remedial action(s).

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Alternate Water Supply; Deferred Decision; Ground Water; Solvents; PCE; TCE; VOCs.

NOVACO INDUSTRIES, MI
First Remedial Action
June 27, 1986

ROD ABSTRACT

Novaco Industries is a one-building facility that occupies a 2.6-acre rectangular parcel of land, located at 9411 Summerfield Road, at the intersection of Summerfield and Piehl, Temperance, Michigan. The site lies 50 miles south of Detroit and 5 miles north of Toledo, Ohio. The Novaco Industries study area consists of Novaco Industries, Veterans of Foreign Wars (VFW) Post 9656 and the Moyer residential property. A below-ground plating tank located within the Novaco Industries building leaked an unknown quantity of chromic acid into the ground water on or before June 13, 1979. Within 24 days following Novaco Industries' detection of the leak, chromium was discovered in Novaco's 20-foot well, as well as the VFW Post's well which was screened in both the shallow and deep aquifer. A year later, chromium was detected in a residential well west of the VFW Post.

The selected remedial alternative will include: construction of an extraction wellfield, a treatment plant consisting of electrochemical reduction, precipitation, filtration, and ion exchange polishing units; and a pipeline to convey treated ground water to Indian Creek; and extraction of approximately 36 million gallons of contaminated ground water over a 4-year period from the sand/gravel aquifer. The extracted ground water will be treated onsite to remove trivalent and hexavalent chromium and will then be discharged into Indian Creek, applying the milestone approach. Total capital cost for the selected remedial action is estimated to be $560,000 with total O&M costs approximately $419,000 for a 6-year period.

PERFORMANCE STANDARDS OR GOALS: The selected remedial alternative does not quantify a specific cleanup level for total chromium, but it is designed to achieve levels that are below drinking water standards. The State of Michigan standards for ground water are more restrictive than the Federal RCRA standard. Michigan sets forth a water quality standard of 50 ug/l (which is the same as the Federal Standard), but in addition the State is authorized to require cleanup to background (less than 0.5 ug/l for total dissolved chromium at Novaco Industries).

KEYWORDS: Chromium; Ground Water; Ground Water Monitoring; Ground Water Treatment.

REILLY TAR AND CHEMICAL, MN (EDD)
Second Remedial Action
May 30, 1986

ROD ABSTRACT:

The Reilly Tar and Chemical Corporation (RTCC) site occupies 80 acres in St. Louis Park, Minnesota. The Republic Creosote Works, which operated the site between 1917 and 1972, fractionalized coal tar into various oils and produced creosote. Between 800,000 - 1,000,000 cubic yards of the wastes resulting from this process polluted the land surface of the site and the underlying aquifers. The primary contaminants of concern include: PAHs and phenols.

The Remedial Action Plan (RAP) attached to the Consent Decree prescribes the following remedial actions, remedial investigations and feasibility studies to be completed over the next five years: Restoration of drinking water supply and water quality by construction of a Granular Activated Carbon (GAC) system at St. Louis Park Wells (SLP 15/10). This task has been completed by the RTCC and is in the start-up process; monitoring and contingency treatment of the Mt. Simon/Hinckley aquifer; monitoring, pumping and treatment of the Ironton/Galesville aquifer; monitoring, pumping and treatment of the Prairie du Chien/Jordan aquifer until drinking water quality is uniformly established within the area of gradient control; monitoring and contingent action for the maintenance of drinking water quality in the St. Peter aquifer; monitoring, pumping and treatment of the Drift and Platteville aquifers; monitoring, pumping and treatment of the source material in the Glacial Drift aquifer and in well WZ3 in the Praire du Chien/Jordan aquifer; capping and tilling of exposed hazardous wastes in the vicinity of the bog, south of the site; discharge of hazardous wastes to a sanitary sewer for any contaminated material excavated and dewatered; further subsequent investigation in the vicinity of the site to implement deed restrictions for current and future land use in the areas of contamination; further RI/FS's to determine the areal extent of, and remedy for the contamination in the Northern area of the Glacial Drift aquifer adjacent to the site; and further RI/FS's in the St. Peter aquifer as necessary to implement the remedial action presented to protect drinking water quality. Cost estimates for these actions have not yet been fully developed.

PERFORMANCE STANDARDS OR GOALS: Drinking water criteria for PAHs were developed through State and EPA consultations.

INSTITUTIONAL CONTROLS: Deed restrictions will be implemented for current and future land use.

KEYWORDS: Consent Decree; Deed Restrictions; Drinking Water Contaminants; Granular Activated Carbon; Ground Water; Ground Water Monitoring; Institutional Controls; O&M; Organics; PAHs; PRP; Phenols; Soils; State Criteria; Surface Water; Wetlands; VOCs.

SEYMOUR, IN
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Seymour Recycling Corporation (SRC) site, encompassing a fourteen-acre area, is approximately two miles southwest of Seymour, IN. Approximately one hundred homes are located within a one-mile radius of the site in a predominately agricultural area. From about 1970 until early 1980 SRC operated a processing center for waste chemicals. Over the years toxic and hazardous wastes, including solvents, metal finishing wastes and other materials, accumulated on the site in 55-gallon drums, bulk tanks and other containers. Wastes leaked and spilled from the drums creating fire and odor problems. A Consent Decree, reached in the fall of 1982 after a May 1980 suit filed by the United States against the owners and site operators, resulted in the removal of approximately the upper one foot of contaminated soil from about 75 percent of the site's surface. Contaminated soil remains, however, and extends throughout the shallow and deep aquifer. The site is fenced and partially covered with a temporary soil cap. Homes surrounding the site have recently been connected to the city water distribution system due to the threat of ground water contamination. The primary contaminants of concern include: VOCs, organics, TCE, DCE, benzene, toluene, and heavy metals.

The selected remedial alternative for the site is the implementation of a plume stabilization system which will extract, treat, and discharge approximately 101,690,000 gallons of contaminated ground water to the Seymour Wastewater Treatment Plant. The estimated capital cost for this remedy is $300,000. O&M costs are estimated to be either $100,000 per year or $250,000 total costs for the 2.5 year period required to implement a final remedial action.

PERFORMANCE STANDARDS OR GOALS: Pretreatment requirements for discharge to the POTW.

KEYWORDS: Air Stripping; Ground Water; Ground Water Treatment; Heavy Metals; Organics; O&M; Plume Management; POTW; Soils; TCE: Toluene; VOCs.

SPIEGELBERG LANDFILL, MI
First Remedial Action
September 30, 1986

ROD ABSTRACT:

The Spiegelberg site is a waste disposal pit located in Green Oak Township, Livingston County, MI. Currently, the Spiegelberg property is being mined for sand, gravel, and peat deposits. From 1966 to 1977 the site was used for the disposal of domestic waste, with the main disposal area located in an abandoned sand and gravel pit in the northern third of the site. From 1967 to 1978 paint sludge was dumped near the surface water portion of the gravel pit. The paint sludge area is approximately one-half acre in size and is reportedly thirty feet deep in several places. There are two layers of hardened paint sludge: at a depth of three to six feet; and at a depth of thirteen feet. Five-gallon paint buckets were also buried at a depth of approximately ten feet and paint mixed with sand is present at various depths. Only private, domestic wastes have been disposed of at the site since the end of 1978. Organic contaminants have been detected in onsite and downgradient monitoring wells indicating the migration of these contaminants from the site into the ground water. The primary contaminants of concern include: VOCS, organics, inorganics, base-neutral compounds, TCE, toluene, xylene, metals.

The selected remedial action for the site includes: excavation of 15,000 cubic yards of waste material which will be separated into liquid and solid sludges and paint residue with garbage intermixed; offsite incineration of approximately 5,000 cubic yards of the excavated waste material; and disposal of the remaining 10,000 cubic yards of waste into a RCRA landfill. The capital cost of this alternative is estimated at $15,771,000 to $18,395,000 depending on the offsite disposal location. No O&M will be required.

PERFORMANCE STANDARDS OR GOALS: Action levels for soil contaminants include: benzene 12.9 ug/kg; chloroform 2.34 ug/kg; methylene chloride 9.9 ug/kg; 1,1,2,2-tetrachloroethane 2.9 ug/kg; tetrachloroethene 14.7 ug/kg; trichloroethene 21.0 ug/kg; n-nitrosodiphenylamine 46.1 ug/kg; gamma -BHC 10.42 ug/kg; chlordane 10.62 ug/kg; heptachlor 10.63 ug/kg. Excavation of contaminated soil to these concentrations will achieve the target ground water concentrations.

KEYWORDS: Excavation; Ground Water; Incineration; Inorganics; Metals; Offsite Disposal; Organics; RCRA Landfill Specifications; Soils; TCE; Toluene; VOCs.

CECIL LINDSEY, AR
First Remedial Action - Final
April 23, 1986

ROD ABSTRACT

The Cecil Lindsey site consists of 5.2 acres, located in rural northeastern Arkansas, approximately 3.5 miles northeast of the city of Newport. Cecil Lindsey accepted waste for salvage and/or disposal from the early 1970s until 1980. The site was first used as a salvage operation, where machinery, automobiles, culvert pipe, and other scrap metal were collected. The southern portion of the site was formerly used to raise pigs and contains a fenced area, an open shed, and a sandpoint well. Later, the northern part of the site was used as a municipal dump by the community of Diaz, located approximately 2 miles to the west. The Cecil Lindsey site was also reportedly used for the disposal of industrial waste. Several local companies may have used the site, but the type and extent of industrial waste disposal is not well documented. The results of the field investigation indicate the presence of very limited onsite soil and ground water contamination and offsite surface water and sediment contamination. Onsite soil samples showed low inorganic concentrations which exceeded background levels scattered throughout the site and also isolated volatile organic contamination. In addition, onsite ground water samples consistently exceeded background concentrations for inorganics, but the onsite volatile organic contamination is limited.

The results of the field investigations have indicated that the low levels of contamination at the Cecil Lindsey site do not create a significant danger to present or future public health or the environment. The selected remedial action for this site consists of a no action alternative with: imposition of site access restrictions; installation of 2 monitoring wells; and one year of ground water monitoring, and removal and disposal of site drums that contain hazardous substances. Total capital cost for these actions is estimated to be $61,000 with O&M costs approximately $10,000 for one year of ground water monitoring.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Ground Water; Ground Water Monitoring; Inorganics; No Action Alternative; Offsite Disposal; Sediments; Soil; Surface Water; VOCs.

GENEVA INDUSTRIES, TX
First Remedial Action - Final
September 18, 1986

ROD ABSTRACT

The Geneva Industries site is a 13.5 acre tract located in Houston, TX, immediately adjacent to the corporate limits of the City of South Houston. Approximately 35,000 people live within one mile of Geneva. The closest residences are located less than 50 feet from the east and southwest site boundaries, and two businesses are located 300 feet west of the site. The site is currently located in the 100-year flood plain and is drained by the adjacent flood control channel. Geneva Industries is an abandoned refinery which manufactured a variety of organic compounds and fuel oils from 1967 through 1978. Approximately 22,500 cubic yards of surface and subsurface onsite soils have been contaminated as a result of operational spills, leaking drums, tanks, and lagoons, and landfill/land farming operations. Shallow ground water is contaminated onsite and some offsite migration has occurred east of the site. A planned removal was performed by EPA between October 1983 and February 1984 to close out three onsite lagoons, remove all drummed waste on the surface, remove all offsite soils containing greater than 50 ppm PCBs, install a cap over onsite soils containing greater than 50 ppm PCBs, and improve site drainage. Other removal actions to plug abandoned wells onsite and remove storage tank materials were performed in May and September 1984 respectively. Further studies were conducted to determine an appropriate permanent site remedy. The primary contaminants of concern include: VOCs, PAHs, TCE, PCBs, phenols and fuel oils.

The selected remedial action includes: removal and disposal of surface structures in an offsite hazardous waste landfill, excavation of contaminated soils with greater than 100 ppm of PCBs and all buried drums onsite; disposal of excavated soils and drums at an EPA-approved offsite disposal facility; construction of a multi-layer surface cap over the site and a slurry wall tied into the clay below the 30-foot sand around the perimeter of the site; and recovery of TCE contaminated ground water from the 30- and 100-foot sand, treatment onsite by carbon adsorption, and discharge into the adjacent flood control channel. The estimated capital cost for this remedy is $14,990,000 with O&M for years one and two of $532,000/year and $483,000 for years three through thirty.

PERFORMANCE STANDARDS OR GOALS: Excavation of 22,500 cubic yards of soils contaminated with greater than 100 ppm PCBs.

KEYWORDS: Aromatics; Capping; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Ground Water Treatment; O&M; Offsite Disposal; Oils; PAHs; PCBs; Phenols; Sediments; Slurry Wall; Soils; Surface Water; TCE; VOCS.

ODESSA CHROMIUM I, TX
First Remedial Action
September 8, 1986

ROD ABSTRACT

The Odessa Chromium I site consists of a series of chromium contaminated wells within 300 acres of residential, commercial and industrial properties and facilities just outside the northwestern city limits of Odessa, Ector County, TX. Nearly every residence or commercial facility is served by one or more water wells completed in the Trinity aquifer which offers the only source of potable ground water. Two potential sources of ground water contamination at the site have been identified: the 4318 Brazos property, and Nipco at 2104 West 42and Street. Between 1972 and 1977 several chrome plating operations functioned at the 4318 Brazos property. Waste water from the plating operations and heavy metal contaminants are believed to have been dumped directly onto the ground on the northern side of the building and/or piped into storage tanks/drums which frequently were allowed to overflow. An abandoned well on the site is suspected of providing a direct pathway to the aquifer during periods of substantial disposal or heavy rain. Nipco, also on the Odessa Chromium I site, is presently operating a metal plating facility. In November 1983, the Texas Department of Water Resources (TDWR) requested the EPA conduct a planned removal action to extend the city water lines to the affected area. However, in June 1984, the TDWR notified EPA that the plan was not feasible due to an Odessa city ordinance prohibiting the supply of water to customers outside the city limits. The primary contaminants of concern include chromium and other heavy metals.

The selected remedial action includes: negotiating agreements with the city and consumers to extend the city water system; and construction of a water distribution system. The estimated capital cost for this action is $247,920 with annual O&M costs of $14,350.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

INSTITUTIONAL CONTROLS: The extension of the city's water lines will require an exception to the rules governing water supply across city limits.

KEYWORDS: Alternate Water Supply; Chromium; Drinking Water Contaminants; Ground Water; Heavy Metals; Institutional Controls; O&M.

ODESSA CHROMIUM II, TX
First Remedial Action
September 8, 1986

ROD ABSTRACT

The Odessa Chromium II site consists of a series of chromium contaminated wells within 200 acres of urban area located just outside the northwestern city limits of Odessa, Ector County, TX. The site area is composed of a mixture of residential, commercial and industrial facilities. Nearly every residence or commercial facility is served by one or more water wells completed in the Trinity aquifer which offers the only source of potable ground water. Two potential sources of ground water contamination at the site have been identified; 5329 Andrews Highway, and Wooley Tool and Manufacturing at 57th Street and Andrews Highway. Between 1950 and 1965, the 5329 Andrews Highway site was occupied by Continental Products of TX, a producer of a chromium containing cooling water additive. Basin Radiator and Supply, commencing operations at this site sometime between 1965 and 1969, was investigated by the local Health Department in 1970 in response to a complaint of contaminated (5.5 mg/l chromium) well water on the property to the south of the company. Waste water analysis, at that time, did not indicate the presence of chromium, but in 1978, a partially buried steel tank leaked a cleaning vat solution containing 2.8 mg/l chromium. Wooley Tool and Manufacturing, operating since about 1950 utilized chromates in their cooling water system until about 1976. This system, tied into one of the plant's water wells, could have inadvertently back flushed into the well during occasional slowdowns due to the absence of a check valve. Until about 1970, the plant also disposed of chromate contaminated waste water in an unlined pit. The primary contaminant of concern is chromium.

The selected remedial action includes extending the municipal water service to the affected area of the site. This involves negotiations with the city and local residents. The capital cost for this action is $476,570 with annual O&M costs of $51,575 to be spent over a 15-year period.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

INSTITUTIONAL CONTROLS: The extension of the city's water lines will require an exception to the rules governing water supply across city limits.

KEYWORDS: Alternate Water Supply; Chromium; Drinking Water Contaminants; Ground Water; Institutional Controls; O&M.

SIKES DISPOSAL PITS, TX
First Remedial Action - Final
September 18, 1986

ROD ABSTRACT

The Sikes Disposal Pits site is located on a 185-acre site, approximately 2 miles southwest of Crosby, TX. It is bordered by the San Jacinto River on the west, Jackson Bayou on the north, and U.S. Highway 90 on the south. The site lies in the 100-year flood plain of the river while portions lie within the 10-year and 50-year flood plain. The site has been flooded four times since 1969. The area immediately surrounding the site is largely underdeveloped with numerous active and abandoned sandpits and low lying swamp areas. The area plays host to sport fishermen as well as water sport enthusiasts on the nearby river and bayou. One family lives onsite. The only residential development in close proximity is 500 feet southwest. Between the early 1960s and 1967, Sikes Disposal Pits operated as a waste depository. Chemical wastes from area petrochemical industries and numerous drums were deposited onsite in several old sand pits. A preliminary sampling at the site in 1982 indicated the presence of phenolic compounds and other organics. In June 1983 a removal action performed at the site by the EPA removed approximately 440 cubic yards of phenolic tars from a partially buried pit. Subsequent studies at the site indicated the need for a total remedial site plan. Onsite soils and surface water from the sludge areas as well as Tank Lake were found to be contaminated. Ground water in the shallow aquifer below the site has been heavily contaminated; no residential wells are currently affected. Neither surface water nor ground water contamination has migrated beyond the site boundaries. Surface water, ground water, and approximately 150,000 cubic yards of soils are contaminated with organics, toluene, creosote, benzene, xylene, phenolic compounds, halides, dichloroethane, and vinyl chloride.

The selected remedial action includes: onsite incineration of sludges and contaminated soils; onsite disposal of residue ash - use as backfill; ban use of upper aquifer onsite, while naturally attenuating to 10^{-5} Human Health Criteria (less than 30 years); discharge contaminated surface water to river, treat as necessary to meet discharge criteria; and monitor lower aquifer and ban its use onsite if site degradation occurs. The estimated capital cost for this action is $102,217,000 with annual O&M of $41,000.

PERFORMANCE STANDARDS OR GOALS: Sludges and soils will be excavated to the 10 ppm VOA criteria level. The upper aquifer will be naturally attenuated to 10^{-5} Human Health Criteria (less than 30 years).

INSTITUTIONAL CONTROLS: Ban use of upper aquifer onsite.

KEYWORDS: Alternative Technology; Excavation; Flood Plain; Ground Water; Ground Water Monitoring; Incineration; O&M; Onsite Disposal; Organics; Phenols; Sediments; Sludges; Soil; Surface Water; Toluene.

UNITED CREOSOTING SITE, TX
First Remedial Action
September 30, 1986

ROD ABSTRACT

The United Creosoting site is a 100-acre tract of land located in the City of Conroe, Montgomery County, Texas. The site is an abandoned wood preserving facility over which two new businesses and a residential subdivision have been built. The site operated from 1946 to 1972, treating wood with creosote and pentachlorophenol (PCP). Prior to salvage and removal operations in 1972, the site contained a coal-tar distillation still, a processing building, tanks and pressure cylinders, two waste ponds, and several areas where treated lumber was stored. The only remaining evidence of the operation are remnants of the waste ponds, an office building and a garage structure. During the summer of 1980, Montgomery County obtained soils from the United Creosoting site to be used in improving local roads in a nearby subdivision. Soil material consisted of surface soils and pond backfill from the Clark Distributing Company property. Citizens living on one of the "improved" streets complained of headaches, burns, respiratory problems and damage to vegetation. Samples indicated that soils were contaminated with PCP in concentrations up to 20.3 mg/l. Montgomery County officials removed the contaminated soils from the affected roadways and disposed of them by landfarming. In early December 1983, EPA initiated an Immediate Response Action at United Creosoting, taking over 25 soil samples. Samples indicated the presence of PCP, chlorinated dioxins (no tetrachlorinated dioxins), and dibenzofurans. EPA ordered Clark Distributing to undertake an Immediate Response Action within the area of the former waste ponds. Work began in November 1983 and consisted of regrading exposed contaminated soils to divert surface water drainage away from the subdivision, capping contaminated soils with a synthetic membrane cap and 6 inches of compacted clay, fencing the capped area, and constructing drainage ditches to channel cap area runoff to the south of the Clark property (vacant land). Work on this activity was completed in April 1984, and the RI/FS for the whole site area was begun in December of 1984. Approximately 84,000 cubic yards of contamination remain onsite.

The selected remedial action for the site includes: purchase and demolish six homes located directly above and adjacent to the former pond area; conduct permanent relocations of the persons currently residing in these homes; consolidate surface soils contaminated with greater than 100 ppm of polynuclear aromatic hydrocarbons (PAHs) and surface soils which are visibly contaminated onto the former waste pond area; construct a temporary cap over consolidated soils; periodically evaluate the availability of offsite disposal facilities and emerging alternate technologies; excavate and dispose of the soils contaminated with greater than 100 ppm of PAHs in the former pond area and in the former storage tank area when an appropriate facility or innovative technology becomes available; backfill excavated areas and restore ground surface with an appropriate cover; and allow ground water attenuation through natural processes of dilution and adsorption. The

UNITED CREOSOTING SITE, TX
First Remedial Action
(Continued)

estimated capital costs of the remedy range from $4.5 million for future offsite land disposal to $140 million for offsite incineration. Factors such as site preparation, material and energy requirements, and disposal requirements must be evaluated before a cost estimate can be developed. Annual O&M costs are expected to be $43,000 during the interim closure period.

PERFORMANCE STANDARDS OR GOALS: Excavation and disposal of all soils contaminated above 100ppm PAH.

INSTITUTIONAL CONTROLS: Residents of six onsite homes will be permanently relocated.

KEYWORDS: Capping; Excavation; Ground Water; Institutional Controls; O&M; Onsite Containment; PAH; Relocation; Soil.

DES MOINES TCE, IA
First Remedial Action
July 21, 1986

ROD ABSTRACT

The Des Moines TCE site, in the flood plain of the Raccoon River, is located just southwest of downtown Des Moines, Polk County, Iowa, near where Fleur Drive crosses the Raccoon River. The area has industrial/commercial use and recreational parkland use. A major feature of the site is the underground infiltration gallery used by the Des Moines Water Works (DMWW) as a source of the public water supply. The site was discovered in 1984 after trichloroethylene (TCE) was detected in the city's public water supply. The Dico Company, operating since at least 1961, disposed of an unknown quantity of oily waste sludge containing TCE onto their parking lot for dust control and into a drainage ditch on their property. Two other businesses that used TCE have operated on the site area in the past, one an aircraft parts manufacturer and the other a printing company. However, the major source of ground water contamination is the soil at the Dico Property. Most of the area east of the Raccoon River has been filled to raise the land above flood level. Contaminants may have been disposed in those areas along with fill material. Migration has caused contaminated ground water to flow into the underground infiltration gallery system. The primary contaminants of concern include: TCE, PCE, 1,2-dichloroethane, vinyl chloride.

The selected remedial action for this site includes: extraction wells to collect the contaminated ground water; isolation of the northern-most section of the north gallery; treatment of the ground water through air stripping to remove 96 percent of the TCE; discharge of the treated water to the Raccoon River; and operation of the west extraction wells until established effluent levels are achieved for four consecutive months. The capital cost for the selected remedial alternative is estimated to be $1,196,000. The estimated annual cost of O&M is $63,000. Since this is an operable unit, the duration of operation of this response action will be dependent on the final response action selected.

PERFORMANCE STANDARDS OR GOALS: The operation of the east and west collection system extraction wells will continue until the maximum observed groundwater TCE concentration in the existing monitoring wells on the west side of the river is 5 ug/l or less for four consecutive months.

KEYWORDS: Air Stripping; Drinking Water Contaminants; Ground Water; Ground Water Treatment; O&M; Sludges; Soil; TCEs; VOCs.

ELLISVILLE SITE AREA, MO
Second Remedial Action
September 29, 1986

ROD ABSTRACT

The Ellisville Site Area, located in West St. Louis County, Missouri, is composed of three non-contiguous properties: the Rosalie property; the Callahan property; and the Bliss property. The Rosalie and Callahan properties were the focus of the July 1985 first remedial action. This second remedial action focuses on the Bliss property and four contiguous properties: the Dubman and Weingart property; the Primm property; the Wade and Merchantile Trust Company property; and the Russell, Evelyn and Jerry Russell Bliss property. Land use in the site vicinity consists of rural, recreational and rapidly developing residential areas. Approximately 1,000 people currently live within a one-mile radius of the site. During the 1960s and 1970s, Russell Bliss owned and operated the Bliss Waste Oil Company, a business engaged in the transportation and disposal of waste oil products, industrial wastes and chemical wastes. The company's headquarters and operating facilities were located at the site. In September 1980 the Missouri Department of Natural Resources and the U.S. EPA conducted an onsite investigation. Concluding reports indicated pits had been dug and used for industrial waste disposal; drums of waste had been buried on site; and liquid wastes had been applied on the ground. The types of waste were reported to include solvents, oils, pesticides, and can coating materials. Dioxin is currently the only contaminant of threat. Approximately 20,000 cubic yards of soil, and an unknown volume of dust are contaminated with 2,3,7,8-TCDD (TCDD or dioxin).

The selected remedy for the dioxin contaminated soils and materials includes: excavation and containerization in semi-bulk sacks of dioxin contaminated soils and material exceeding one part per billion; interim onsite storage of the containerized wastes in a metal building enclosure; O&M will include maintenance of the security system, maintenance of site runon/run off controls and ground water sampling and analysis. Final remedial action for dioxin-contaminated soil has not been selected. The selected remedy for buried drums and non-dioxin hazardous waste mixtures includes: excavation, sampling, and overpacking of buried drums; excavation of uncontainerized hazardous wastes and contaminated soils and materials; drums and waste mixtures containing liquids or other specified hazardous wastes subject to land disposal prohibitions will be disposed by incineration at an offsite commercial hazardous waste incineration facility operating under an appropriate RCRA permit or interim status; drums and waste mixtures containing hazardous substances suitable for land disposal will be disposed of at an offsite commercial hazardous waste land disposal facility operating under an appropriate RCRA permit or interim status or, if cost-effective, at an incineration facility as described above; non-hazardous material and debris may be disposed of at a permitted sanitary landfill. For both dioxin and non-dioxin remedy components, site restoration activities will include backfill, regrading and seeding where appropriate. The estimated present worth cost for both remedial components is $20,200,000.

PERFORMANCE STANDARDS OR GOALS: Excavation and sampling will continue until demonstrated, at the 95 percent upper confidence level, that dioxin concentrations in soil do not exceed one part per billion.

KEYWORDS: Dioxin; Excavation; Ground Water Monitoring; Offsite Disposal; Onsite Containment; Public Health Risk; RCRA; O&M; Organics; Soil; State Criteria.

DENVER RADIUM/ROBCO, CO
Second Remedial Action
September 30, 1986

ROD ABSTRACT:

The Denver Radium/ROBCO site encompasses both the Robinson Brick Company facility (ROBCO) and the Denver and Rio Grande Western Railroad (DRGWR) right-of-way in Denver, CO. The ROBCO property is located on the site of the former National Radium Institute (NRI) facility, a private corporation operating between 1914 and 1920 which produced radium under an agreement with the U.S. Bureau of Mines. In 1979 the EPA discovered a reference to the NRI in a 1916 U.S. Bureau of Mines report. Subsequent research revealed the ROBCO property as one of thirty-one radioactive sites in the Denver metropolitan area. There are seventeen buildings and sheds on site. Two of the buildings, the laboratory and office, are original NRI structures. There is no serious public health risk at present from the radon gas and its decay products found onsite. However, since radium has a half-life of 1600 years, there is a long-term potential for increased public health risk if the radium-contaminated materials were misused or inadvertantly spread.

The EPA preferred alternative, full removal and permanent offsite disposal, entails: removal of approximately 6400 cubic yards of radium-contaminated soil from the ROBCO property and approximately 600 cubic yards of radium contaminated soil from the DRGWR right of way; removal of approximately 200 cubic yards of debris from the demolition of the radioactively contaminated laboratory and office buildings on the ROBCO property; and disposal of the contaminated soil and debris at a facility suitable for the permanent disposal of low-level radioactive waste. Until a cost-effective site suitable for permanent disposal is selected and, if necessary, acquired and developed, this remedy cannot be implemented. Therefore, the EPA is actively pursuing a temporary onsite storage remedy. The estimated capital costs for the temporary remedies is $1,912,400 for onsite storage. These costs include future transport costs of the waste material to a permanent disposal facility. There will be an estimated annual O&M cost of $6,000 which will be incurred for three to seven years depending upon the time needed to identify a permanent storage facility.

PERFORMANCE STANDARDS OR GOALS: Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites." More specifically, the concentration of radium-226 in land over any area of 100 square meters shall not exceed the background level by more than 5pCi/g, averaged over the first 15cm of soil below the surface, and 15pCi/g, averaged over 15cm thick layers of soil more than 15cm below the surface.

KEYWORDS: Excavation; Interim Remedy; O&M; Offsite Disposal; Onsite Disposal; Radioactive Material; Soils; Stabilization.

DENVER RADIUM SITE STREETS, CO
First Remedial Action
March 24, 1986

ROD ABSTRACT

Denver Radium Site Streets is located in Denver, Colorado. This operable unit is comprised of eight street segments in the Cheesman Park area and one segment in the upper downtown area. The nine contaminated street segments are owned by the City and County of Denver and extend approximately 4.5 miles through largely residential areas. The Denver Radium Site Streets contain a 4- to 6-inch layer of radium contaminated asphalt. The contaminated layer is underlain by compacted gravel road base and is usually overlain by 4 to 12 inches of uncontaminated asphalt pavement. There is an estimated 38,500 cubic yards of contaminated material covering approximately 832,000 square feet. Radioactive contamination does not extend beyond the paved right-of-way of the streets and generally does not appear to have migrated into the soils below the contaminated asphalt. Radium concentrations at representative locations on the streets range from 4 to 79 picocuries per gram. Surface gamma radiation readings generally fall below 20 microroentgens per hour above background.

The selected remedial action for this site includes: leaving the contaminated material in place; improving institutional controls. Although not a part of the EPA-funded remedy, the ROD recommends that the City consider removing any contaminated material excavated during routine maintenance, repair, or construction activities in the affected streets to a facility approved for storage or disposal of contaminated material. The estimated initial cost of the remedy is $30,000. This includes the cost of studying and then establishing the institutional controls which would monitor all construction and utility work for the affected streets. The annual operation and maintenance cost will vary depending upon the amount of material excavated during any particular year.

PERFORMANCE STANDARDS OR GOALS: The selected remedy meets the supplemental standards for "Remedial Action at Inactive Uranium Processing Sites" which states, "remedial action is not necessary when residual radioactive materials have been placed semi-permanently in a location where site-specific factors limit their hazard, and from which they are costly or difficult to remove."

INSTITUTIONAL CONTROLS: Improve institutional controls so that all routine maintenance, repair, or construction activities in the affected streets by government agencies, utility companies, contracting companies, and private individuals will be monitored.

KEYWORDS: Excavation; Institutional Controls; Municipally-Owned Site; Offsite Disposal; Radioactive Materials.

LIBBY GROUND WATER, MT
First Remedial Action
September 26, 1986

ROD ABSTRACT:

The Libby Ground Water Contamination site, in the northwest corner of Montana, consists of Champion International Corporation's active lumber and plywood mill, the City of Libby, and surrounding developed but unincorporated areas. The Champion lumber and plywood mill was owned and operated by the J. Nells Lumber Company from 1946-1957, and by St. Regis Company from 1957-1985. Abandoned wood treating operations on the mill property are the source of ground water contamination. Between 1946 and 1969, wood treating fluids were disposed of and spilled at several different mill locations; waste water, formed as condensate in the retorts, was placed in onsite waste pits; and tank bottom sludges from wood treating fluid tanks were periodically removed and hauled to the waste pits. In 1979, shortly after installation of private wells, some homeowners detected the presence of a creosote odor, and EPA monitoring in 1981 confirmed ground water contamination. Based on 1984 well sample results, Champion implemented the Buy Water Plan. Under this plan, individuals with contaminated ground water wells agree to cease using their well and use water from the public water system operated by the City of Libby. Champion, providing monetary compensation to the wellowners to pay for this metered water, also caps and locks the previously operating wells. The program, indefinite in term, would be terminated upon the elimination of the threat of contamination, if the well owner provides a written termination notice, or if other alternatives become available. The primary contaminants of concern include: VOCs; PAHs, PCP and other organics, inorganics, heavy metals, and creosote.

The selected remedial action for this first operable unit includes: continuation and expansion of the Buy Water Plan sponsored by Champion; and enactment of an ordinance which prohibits installation of new wells for human consumption and irrigation, but would allow well installation for use in closed systems such as heat pumps. The estimated capital cost for this remedy is $152,000 with annual O&M costs of $64,000, both to be paid by Champion. Federal funds will be required for oversight of Champion's actions at an estimated annual cost of $20,000.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

INSTITUTIONAL CONTROLS: City Ordinance No. 1344 precludes the installation of new wells for human consumption and irrigation while allowing well installation for use in closed systems. Annual inspection of the well is a condition of the well permit.

KEYWORDS: Alternate Water Supply; Drinking Water Contaminants; Ground Water; Heavy Metals; Inorganics; Institutional Controls; O&M; Organics; PAHs; PRP; Soil; Surface Water; VOCs.

MARSHALL LANDFILL, CO
First Remedial Action - Final
September 26, 1986

ROD ABSTRACT:

The Marshall Landfill, located three miles southeast of Boulder, Boulder County, CO, consists of two parcels: an 80-acre active County landfill and an 80-acre inactive landfill due north. Between 1965 and 1974, the inactive landfill accepted unstabilized sewage sludge and many unidentified and potentially hazardous wastes. Septic wastes and possibly liquid industrial wastes were also disposed offsite in two, now closed, septic ponds. Since 1974, the active landfill has accepted sewage sludge and municipal waste. (Industrial waste may have been accepted during the early years of operation.) Since 1975 the active landfill has been operated by Landfill Inc. (LI), a wholly-owned subsidiary of Browning-Ferris Industries (BFI). Prior to 1978, County inspectors observed landfill leachate seepage into Community Ditch, a conveyor of potable water from nearby Marshall Lake to the City of Louisville and irrigation water for the Farmers Reservoir and Irrigation Co. Two remediation actions have been taken subsequent to the July 1982 EPA proposal for inclusion on the NPL: a mid-1983 Cooperative Agreement to which LI agreed to install a pipeline to convey water from Marshall Lake across the inactive landfill and conduct an RI/FS; and an October 1983 order by EPA to LI to install the above mentioned pipeline, and to submit to EPA data and reports prepared pursuant to the Cooperative Agreement. The primary contaminants of concern include: VOCs including TCE, PCE, DCE, and benzene, and heavy metals including cadmium and lead.

The selected remedial action includes: installation of a subsurface collection system using natural ground water gradients to collect all contaminated ground water leaving the Marshall Landfill site; treatment of contaminated ground water by sedimentation, air stripping, and off-gas carbon adsorption; landfill improvements, including regrading, revegetation, perimeter ditches, and fences, to minimize future environmental and public health impacts from the site; and ground and surface water monitoring. The estimated capital cost for this remedy is $1,819,000 with annual O&M costs of $1,152,000.

PERFORMANCE STANDARDS OR GOALS: Contaminated water will be treated to achieve removal of benzene 0; tetrachloroethylene 0; trichloroethylene 0; cadmium 0.6 mg/l; lead 4 mg/l.

KEYWORDS: Air Stripping; Ground Water; Ground Water Monitoring; Ground Water Treatment; Heavy Metals; O&M; Organics; PCE; Surface Water; TCE; VOCs.

NORTH DAKOTA ARSENIC TRIOXIDE, ND
First Remedial Action
September 26, 1986

ROD ABSTRACT:

The North Dakota Arsenic Trioxide site consists of twenty townships in the Richland, Ransom, and Sargent counties in southeastern North Dakota. About 4,500 people live in this sparsely populated farmland area. Ground water use includes residential consumption, irrigation, and livestock watering. The contamination, limited to ground water, appears to have two sources: naturally occurring arsenic contained in shales native to the area; and an estimated 330,000 pounds of arsenic-laced bait used to control grasshopper infestations in the 1930s and 1940s. In 1979, during quality monitoring of the municipal water supplies, the Water Supply and Pollution Control division of the North Dakota State Department of Health detected elevated levels of arsenic in the towns of Lidgerwood and Wyndmere. Additional monitoring found widespread and highly variable occurrences of arsenic in rural areas. In the late 1970s, approximately 278 homes in Lidgerwood, which use private well systems, were considered to be at a health risk due to arsenic exposure. An Emergency Response Action, instituted by the EPA and implemented in 1986, consisted of installing point-of-use treatment units for affected households, and provided for further study of a former arsenic-bait mixing site at Wyndmere. The primary contaminant of concern is arsenic in various forms.

The selected remedial action for this site includes: expansion and hookup of homes to the existing Richland Rural Water System; construction and hookup of homes to a new rural water treatment and distribution system; and evaluation of institutional controls. Ground water treatment areawide was ruled out as technically infeasible. The estimated capital cost for this selected remedy is $2,212,600 with annual O&M of $57,400.

PERFORMANCE STANDARDS OR GOALS: Must attain arsenic concentration of 25 ppb in the municipal water supply.

INSTITUTIONAL CONTROLS: Institutional controls will be further evaluated during the design phase. This investigation will include analyses of restrictions on existing well use and new well drilling, a well permitting system, and economic incentives for participation in the new distribution system and non-use of well water.

KEYWORDS: Arsenic; Alternate Water Supply; Background Levels; Drinking Water Contaminants; Ground Water; Ground Water Monitoring; Institutional Control; O&M.

SMUGGLER MOUNTAIN, CO (EDD)
First Remedial Action
September 29, 1986

ROD ABSTRACT:

The Smuggler Mountain site is located immediately northeast of the City of Aspen in Pitkin County, CO. It comprises 110 acres of waste rock, tailings, and slag containing high levels of lead and cadmium. The site is in close proximity of Aspen, CO which has a year-round population of 4,500. In many cases, development in the Aspen area has taken place directly over waste piles, or waste piles have been moved to the sides of developed areas and remain as berms or mounds of contaminated soil. Portions of contaminated soil have also been used for fill in some areas. The City of Aspen obtains drinking water from surface waters in the area. The Roaring Forke River passes the site approximately 1,000 feet downgradient to the southwest, and is the nearest surface water. The mining wastes which characterize the site are the result of years of extensive mining, milling and smelting operations. As a result, approximately 410,000 cubic yards of wastes are highly dispersed, and little is known about their disposition. Soil is the primary contaminated medium; however, contaminants have been detected in some ground and surface waters.

The selected remedial action for the site is broken into two distinct operable units. Operable Unit 1: excavation and permanent onsite disposal of soils with lead above 5,000 ppm, including a RCRA multi-layer cap; soil capping of all areas with lead between 1,000 and 5,000 ppm lead; five-year ground water monitoring; and provision of a permanent alternate water supply for 5-7 residences. Operable Unit 2: supplemental RI/FS, with possible ground water remediation and mine reclamation activities. Estimated capital cost of the remedy is $1,816,550 with annual O&M costs of $30,900.

PERFORMANCE STANDARDS OR GOALS: Soils contaminated with lead above 5,000 ppm will be disposed of in a permanent onsite storage facility; soils between 1,000 ppm and 5,000 ppm lead will be covered with 6-12 inches of clean topsoil.

KEYWORDS: Alternate Water Supply; Capping; Drinking Water Contaminants; Excavation; Heavy Metals; Ground Water; Ground Water Monitoring; Mining Wastes; O&M; Onsite Disposal; RCRA Onsite Disposal Requirements; Soil.

UNION PACIFIC RAILROAD, WY
First Remedial Action
September 26, 1986

ROD ABSTRACT:

The Union Pacific Railroad (UPRR) Tie Treating Plant is located southwest of Laramie, Wyoming to the west of Laramie River. UPRR began operations at the site in 1886 and treated railroad ties and other wood products until 1983. Wood preserving agents used by UPRR or its contractor (the J.H. Baxter Company) in the treatment process included zinc chloride (1886-1931), a creosote oil and asphalt-based petroleum/residuum oil mixture (1928-1983), and PCP (1956-1983). During the first 70 years of operation, process wastes from the plant were disposed of in the Laramie Waste Collection ponds. Contamination outside of the collection ponds was initially discovered in October 1981 as a result of RCRA interim status ground water monitoring requirements. Currently, approximately 140 acres of the 700 acre site are contaminated. The contamination ranges from soil saturated with free oil to ground water containing dissolved contaminants. The primary contaminants of concern include: creosote, PCP, and oils.

The selected interim source control remedy is a Contaminant Isolation System which includes: realignment of the Laramie River channel 150 feet further west from the site; a soil-bentonite slurry barrier wall constructed through the alluvium and bedrock around the contaminated areas; a reverse-gradient ground water draining and pumping system; an activated carbon water treatment plant. The treated water will be discharged to the Laramie River under the authority of an NPDES permit issued and administered by the State of Wyoming; and ground water monitoring. The estimated capital costs for this remedy is $7,000,000 with annual O&M costs of $57,000.

PERFORMANCE STANDARDS OR GOALS: Performance goals not specified in the ROD.

KEYWORDS: Clean Water Act 404 Permit; Ground Water; Ground Water Monitoring; Ground Water Treatment; Metals; O&M; Oils; Organics; Soil; Slurry Wall; State Criteria; Temporary Remedial Measure; VOCs.

IRON MOUNTAIN, CA
First Remedial Action
October 3, 1986

ROD ABSTRACT

Iron Mountain Mine (IMM) is located in the southeastern foothills of the Klamath Mountains, approximately nine miles northwest of the City of Redding, California. Between the 1860s and 1962, IMM was periodically mined for iron, silver, gold, copper, zinc, and pyrite. The mine area, believed to be one orebody which has been segmented by faulting, is located on 4,400 acres of property that includes underground workings, an open pit mining area, waste rock dumps, and tailings piles. Rainfall, infiltrating into the underground mine workings, mixes with ground water and the ore zone to produce sulfuric acid and high concentrations of zinc, cadmium, and copper. The resulting heavy metal-laden acidic waters, referred to as acid mine drainage (AMD), eventually discharge through mine adits or ground water seepage into the Spring Creek watershed streams, Spring Creek Reservoir, and the Sacramento River. The primary contaminants of concern include: AMD, copper, cadmium, and zinc.

The desired remedial action for this site was not selected due to excessive cost. Instead, a fund balancing waiver to the NCP was invoked, and an alternative that most closely approaches ARARs was selected. The alternative includes: capping 2.5 acres of selected cracked and caved ground areas using a soil-cement mixture or other suitable material; diverting clean surface water in Upper Spring Creek to Flat Creek, diverting clean surface water in South Fork Spring Creek to Rock Creek, and diverting clean Upper Slickrock Creek water around waste rock and tailings piles; enlarging Spring Creek Debris Dam from its present capacity of 5,800 acre feet to 9,000 acre feet; implementing perimeter control as needed to minimize direct contact threat; and performing a hydrogeologic study and field-scale pilot demonstration to better define the feasibility of utilizing low-density cellular concrete to eliminate or reduce acid mine drainage formation. The estimated capital costs for the fund-balanced alternative is $68,100,000 with O&M present worth costs of $4,100,000.

PERFORMANCE STANDARDS OR GOALS: Below Keswick Dam the remedial actions will achieve the Regional Board Basin Plan objectives: copper 5.6 ug/l; zinc 16.0 ug/l; cadmium 0.22 ug/l for every year evaluated except the worst case year (1978) at which time EPA Water Quality Criteria for Protection of Aquatic Life: copper 5.4 ug/l; zinc 47.0 ug/l; cadmium 0.55 ug/l will be met.

KEY WORDS: Alternative Technology; Acids; Cadmium; Capping; Fund Balancing; Ground Water Diversion; Heavy Metals; Inorganics; Mining Wastes; O&M; Sediments; State Criteria; Surface Water.

QUEEN CITY FARMS, WA (IRM/EDD)
First Remedial Action
October 24, 1985

ROD ABSTRACT

The Queen City Farms (QCF) site is a 320-acre parcel of land located approximately 2.5 miles north of the town of Maple Valley in King County, Washington. The site includes a wooded area, a lake known as Queen City Lake, six industrial waste disposal ponds, an airstrip, several residences, and a gravel pit. The six ponds on the site were used for the disposal of industrial wastes from approximately 1955 to 1964. Because of the time period, few records exist regarding the exact types of wastes taken to the site. However, in 1980 six waste ponds were sampled by EPA contractors. The analyses of water, sludge, and sediment samples identified the presence of 22,000 cubic yards of waste containing 44 priority pollutants. Some of the contaminants found were: chromium, lead, PCBs, acids, volatile organics, toluene and TCE.

The recommended Initial Remedial Measure is to be carried out in three phases. Phase 1 will include mobilization onto the site, installation of the initial upgradient water diversion system, and processing of Pond 1 waste. Phase 2 will involve processing of Pond 2 and 3 materials. Phase 3 will include the installation of the final upgradient water diversion system and cap, final grading and revegetation, and demobilization from the site. A truck-mounted phase separator will be located onsite to process the waste. Pond water will be used to charge the separator. Sludge will be pumped to the separator using a pond skimmer which will be supplemented with mechanical excavation of sludge. The phase separator will separate the sludge into four components: grit, cake, oils, and water. The liquid portions of the separated phases will be stabilized such that an exothermic reaction occurs and no free liquid is present. Stabilized material and other solid products produced during the phase separation will be treated as hazardous waste and transported to a RCRA-permitted chemical waste landfill. In addition, contaminated soils which surround the ponds will be moved into depressions created by removal of the chemical sludge (prior to capping). Finally, to assess the performance of this source control remedial action, a monitoring system will be installed. Total capital cost for all phases of the selected initial remedial measure is estimated to be $3,439,000. In accordance with the CERCLA Section 106 Consent Order, the PRPs will establish a perpetual trust to assure the continued funding of monitoring and maintenance activities in the area of Ponds 1, 2, and 3, where the Initial Remedial Measures will be conducted.

PERFORMANCE STANDARDS OR GOALS: Not specified for processed waste from Pond 1 and excavated contaminated soil.

KEYWORDS: Acids; Capping; Carcinogenic Compounds; Chromium; Excavation; Ground Water; Ground Water Diversion; Ground Water Monitoring; Heavy Metals; Offsite Disposal; PCBs; Phenols; PRP; Sediments; Sludge; Solidification; Stabilization; Surface Water Diversion/Collection; PCE; TCE; Toluene; VOCs.

TOFTDAHL DRUMS, WA
First Remedial Action - Final
September 30, 1986

ROD ABSTRACT:

The Toftdahl Drum site, approximately 15 acres in area is located four miles east-southeast of Battleground, Washington, and contains three main areas where hazardous substance hauling activities may have occurred: a drum cleaning area; an initial burial trench; and a final drum burial area. The surface of the site slopes downward to the northwest to a spring and a small westerly flowing tributary of Morgan Creek (informally referred to as Toftdahl Creek), or about 350 feet to the southeast directly to Morgan Creek. The general land use in the area is rural residential with approximately 14 homes within an approximately 90-acre area. In the early 1970s, Mr. Toftdahl allegedly had 100 to 200 drums containing unknown amounts of industrial waste, possibly from a plywood manufacturer, delivered to his property. His intent was to clean and resell the drums. Unable to resell about 50 uncleaned drums, he constructed a burial trench about 500 feet from the cleaning location, placed crushed drums into the trench, and covered the trench with mounded dirt. The drums were rediscovered in the mid 1970s when the Davis Family, new owners of a portion of the Toftdahl property, attempted to level the mound over the burial trench. In 1978 or 1982, Mr. Toftdahl removed approximately 38 drums and disposed of them in a local landfill, while approximately 12 drums were reburied in the final burial location. In 1982 the Washington Department of Ecology, notified of the possible presence of buried drums at the site, conducted an investigation. Approximately six crushed and badly rusted drums were sampled and stored onsite and a fence was placed around the final drum burial area. In November 1983 the Washington Department of Social and Health Services (DSHS) determined, based on the available sampling data from nearby residential wells, there was no immediate public health hazard in the drinking water. However, DSHS was concerned about the potential for future contamination from the high levels of heavy metals and synthetic organic compounds detected in the soil and drum samples. While several priority pollutants were detected in the RI sampling and analysis program, the concentration of such contamination is very small and could reflect a source(s) not related to this particular drum cleaning and disposal operation. In most sampling cases, the concentration levels could not be reliably differentiated from background values or laboratory-introduced variability. No significant or extensive contamination of surface soils, surface water, or ground water is present at the site. Indicator constituents, defined as having been detected at least one time during investigational sampling include: heavy metals, VOCs, base-neutral organic compounds, cyanides, and PCBs.

The remedial action selected for this site includes: a no further action response; and semi-annual ground water monitoring for five years, followed by ten years of annual monitoring pending continued funding by the Washington State Legislature.

PERFORMANCE STANDARDS OR GOALS: Not Applicable.

KEYWORDS: Background Levels; Ground Water Monitoring; No Action Alternative; O&M.

112

UNITED CHROME, OR
First Remedial Action - Final
September 12, 1986

ROD ABSTRACT:

The United Chrome Products (UCP) site is a former industrial hard chrome plating facility located in Corvallis, Oregon. UCP began electroplating operations in 1956. Between 1956 and 1975 an onsite dry well was used to dispose of floor drippings, washings, and product rinsate collected in a sump within the building. The liquids were reportedly neutralized with sodium hydroxide and/or soda ash prior to disposal. Use of the dry well was discontinued in 1975. As a result of the Immediate Removal Action, to stabilize the site, all hazardous substance source materials have been removed with the exception of residual sludges in the bottom of the plating tanks. However, there is considerable chromium contamination in the soil beneath and around the building and in the upper and lower aquifers as a result of leaching from the dry well and plating tanks.

The selected remedial action for this site includes: installation of approximately 15 shallow wells in the upper confined ground water zone; installation of 5 deep wells in the lower confined production aquifer; limited excavation of 350 tons of contaminated soil and offsite disposal; installation of onsite treatment equipment (chemical reduction and precipitation) to remove chromium from extracted ground water; construction of two percolation basins to flush soil; and installation of culverts. Estimated capital cost for the selected remedial alternative is $1,580,000 and the annual O&M costs are approximately $261,000.

PERFORMANCE STANDARDS OR GOALS: The cleanup criteria for the confined aquifer is 0.05 mg/l and for the unconfined zone it is 10 mg/l chromium. A treated effluent concentration of 0.3 to 0.4 mg/l chromium is expected to be maintained.

KEYWORDS: Alternative Technology; Chromium; Drinking Water Standards; Excavation; Ground Water; Ground Water Treatment; Heavy Metals; Leachate Collection/Treatment; O&M; Offsite Disposal; Soil.

SECTION III

RECORDS OF DECISION

SUMMARY TABLE

The FY86 Record of Decision (ROD) Summary Table provides an overview of site problems, selected remedies, cleanup criteria and estimated costs provided in the RODs signed during FY86. The table is presented by Region, in alphabetical order according to the site name.

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
01	Auburn Road, NH	09/17/86	1st O.U.	GW, SW, sediments and soils contaminated with VOCs, inorganics, and extractable organics	N/A	Extension of existing water supply	N/A	2,372,000 (present worth)	57,000
01	Baird and McGuire, MA	09/30/86	1st O.U.	Soils, sediments SW and GW contaminated with VOCs, inorganics, pesticides, dioxin, phenols, base-neutral compounds, PAHs and heavy metals	191,000 cy	Excavation and onsite thermal destruction of contaminated soils; GW pump and treat	Excavation will remove approximately 95 percent of contamination by mass; action levels for GW remediation will be developed during design	44,386,000	O&M costs included in capital cost estimate
01	Industri-plex, MA	09/30/86	1st O.U.	GW, soil and air contaminated with heavy metals, VOCs, toluene, benzene	1,000,000 cy	Soil grading and capping; GW monitoring; GW pump & treat; institutional controls	Soils: eliminate direct contact threat of soils with arsenic >300 ppm, lead >600 ppm, chromium >1000 ppm; GW: treatment to MCLs Air: remedy to achieve NAAQS and unit cancer risks	12,302,300 or 12,612,000 depending on air treatment (present worth)	285,500 or 311,000 depending on air treatment
01	Kellogg-Deering Well Field, CT	09/25/86	1st O.U.	GW contaminated with TCE, PCE, DCE and other VOCs	N/A	Bring into operation existing air stripping facilities to remove VOCs from GW, discharge to an existing treatment plant	GW treatment will achieve a 99 percent TCE removal efficiency which corresponds to a 10^{-6} excess cancer risk	263,000 (present worth)	52,836
01	Tinkham Garage, NH	09/30/86	1st O.U. (Final Remedy)	VOC-contaminated GW, SW and soils	10,800 cy	Excavation & onsite treatment of soils via aeration, soil washing or composting; onsite disposal; GW pump and offsite treatment; GW monitoring	Soil treatment to 1 ppm TVO or lower; GW treatment to 5 ppb for PCE and TCE	2,058,000	874,000

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
01	Winthrop Landfill, ME	11/22/85	1st O.U. (Final Remedy)	GW contaminated with organics	N/A	Alternate water supply; institutional controls; ground water monitoring; RCRA cap	Establish ACL for each ground water contaminant	6,000,000	42,000 (ACL not exceeded) 360,000 - 1,480,000 (ACL exceeded)
02	Brewster Well Field, NY	09/30/86	1st O.U.	GW contaminated with volatile halogenated organic compounds (VHOs), including TCE, PCE and DCE	N/A	Continue operation of existing air stripping system; GW pump and treat	Existing air stripping system exceeds all State and Federal ARARs for GW (10 ug/l TCE for State; 5 ug/l TCE for Federal)	163,912	27,468
02	Caldwell Trucking, NJ	09/25/86	1st O.U.	GW and soils contaminated with VOCs, PCBs, inorganics and lead	28,000 cy	Excavation, heat addition and onsite landfilling of soils; GW treatment & alternate water supply	Specific performance standards or goals not outlined in the ROD	5,490,000	48,000
[illegible]	Combe Fill North, NJ Landfill	09/29/86	1st O.U. (Final Remedy)	Soils and GW contaminated with low levels of VOCs, phenol and base-neutral compounds	N/A	RCRA Subtitle D landfill closure	Specific performance standards or goals not outlined in the ROD	10,500,000	168,000
02	Combe Fill South, NJ Landfill	09/29/86	1st O.U. (Final Remedy)	Soils and GW contaminated with VOCs	N/A	RCRA capping of landfill; GW pump & treat; alt. water supply	Specific performance standards or goals not outlined in the ROD	46,060,700	673,000
02	Florence Landfill, NJ	06/27/86	1st O.U. (Final Remedy)	Soils and GW contaminated with heavy metals, phthalates and vinyl chloride	N/A	Removal & onsite disposal of lagoon liquids & sediments; cap & slurry wall; leachate collection and treatment	Specific performance standards or goals not outlined in the ROD	8,021,000	170,000

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
02	Hyde Park, NY	11/26/85	1st O.U. (Final Remedy)	Soils and GW contaminated with dioxin, PCBs, and organics	80,000 tons	Possible extraction and incineration of non-aqueous phase liquids; GW pump & treat; construction of plume contaminant systems	Cancer risk level of less than 10^{-6} will be achieved	Not provided in ROD	O&M costs not provided in ROD
02	Kentucky Avenue Well Field, NY	09/30/86	1st O.U.	GW contaminated with VOCs, TCE and chlorinated solvents	N/A	Hookup of all private well users to public water supply; GW monitoring	Remedy to attain MCL for TCE (5 ppb)	303,000	19,000
02	Lang Property, NJ	09/29/86	1st O.U. (Final Remedy)	VOC and heavy metal-contaminated soils, GW, SW and sediments	6,500 cy	Excavation and offsite disposal of soils and waste material; GW pump and treat	Effluent from GW pump and treat will attain SDWA criteria	2,322,000	612,000
02	Marathon Battery, NY	09/30/86	1st O.U.	SW, sediments, and biota contaminated with cadmium, nickel, and cobalt	30,083 cy	Excavation and offsite disposal; sediment thickening and chemical fixation; marsh restoration; revegetation	Sediments will be treated to a 100 mg/kg established background concentration for cadmium. Standards for total cadmium water concentrations are 6.6×10^{-4} and 2.0×10^{-3} mg/l for water hardness levels of 50 and 200 mg/l respectively	16,640,000	3,530,000 for year 1 180,000 for years 2-5 127,000 for years 6-30
02	Metaltec/Aerosystems, NJ	06/30/86	1st O.U.	Soils and GW contaminated with TCE, DCE, vinyl chloride and copper	10,000 cy 4,000 cy	Excavation, heat treatment and offsite disposal of soils; Excavation and offsite disposal of soils; alternate water supply	TCE & PCE, 5 ug/l; chromium and lead, 100 ppm; zinc, 350 ppm; copper, 170 ppm for soils based on Federal MCLs and State criteria	7,005,000 (sanitary L/F) or 11,735,000 (RCRA L/F)	179,000
02	Price Landfill, NJ	09/29/86	2nd O.U. (Final Remedy)	GW contaminated with VOCs, inorganics and TCE	N/A	GW pumping; onsite pretreatment and discharge to a POTW; site capping	Extraction and treatment until TVO concentration in GW reaches 10 ppb or less	9,050,000 (present worth)	1,010,000 (for years 1-5)

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
02	Rockaway Borough Well Field, NJ	09/29/86	1st O.U.	TCE & PCE contamination of GW	N/A	Rockaway Borough will continue to operate GW treatment system	Municipal treatment system designed to remove TCE & PCE to 5 ppb	0	74,800
02	Sharkey Landfill, NJ	09/29/86	1st O.U. (Final Remedy)	Soils & GW contaminated with VOCs, TCE, inorganics and heavy metals	N/A	Landfill capping; GW pump and treat	Performance standards for GW treatment not outlined in the ROD	23,173,000	330,000
02	Syncon Resins, NJ	09/29/86	1st O.U.	Soils, sediments and GW contaminated with VOCs, PCBs, heavy metals and base-neutral compounds	700 cy 2,000 cy	Excavation of lagoon sediments and highly contaminated subsurface soils with offsite disposal; Excavation and offsite disposal of surface soils; GW pump and treat	Soil removal to achieve these levels: PCBs, 5 ppm; base-neutrals, 100 ppm; TVOs, 1 ppm; and various different levels for heavy metals	5,600,000	209,000
02	Vestal Water Supply Well 1-1, NY	06/27/86	1st O.U.	VOC & TCE-contaminated GW	N/A	Air stripping of well 1-1	Specific performance standards or goals not outlined in the ROD	389,400	119,750
03	Army Creek Landfill, DE	09/30/86	1st O.U.	GW, SW, soil and sediments contaminated with VOCs, benzene, inorganics, heavy metals	1,900,000 cy	Downgradient GW pumping with monitoring; landfill capping; possible upgradient controls	Specific performance standards or goals not outlined in the ROD	12,030,000 or 12,340,000 with upgradient controls	307,000 or 393,000 with upgradient controls
03	Blosenski Landfill, PA	09/29/86	1st O.U.	GW, SW, and soil contaminated with VOCs, inorganics, benzene, TCE, PCBs, pesticides	N/A	Excavation and removal of buried drums; offsite disposal; alternate water supply; GW monitoring and onsite treatment; capping; source reduction program	Removal of contaminated media will attain a 10^{-6} excess cancer risk	11,000,000-15,000,000 (13,000,000 estimated baseline cost)	534,300 for years 1 & 2

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
03	Bruin Lagoon, PA	09/29/86	2nd O.U. (Final Remedy)	Soils and bedrock contaminated with acidic sludges and heavy metals, noxious gas release	17,500 cy	Stabilization/neutralization of sludge and perched liquid zone; In-situ treatment of bedrock; Capping	Specific performance standards or goals not outlined in the ROD	2,695,000	16,000
03	Chisman Creek, VA	09/30/86	1st O.U.	GW and SW contaminated with heavy metals (nickel); 3 disposal pits contaminated with fly ash	484,600 cy	Capping (2 pits); capping and upgradient GW diversion in one pit; alternate water supply; possible deed restrictions; GW pump & treat	Action for nickel complies with the AWQC for protection of fresh water aquatic life (88 ug/l - 280 ug/l) and salt water aquatic life (17 ug/l)	14,119,000	506,000 (1st year) 64,000 (years 2-30)
03	Delaware City PVC, DE	09/30/86	1st O.U.	GW, SW, and soils contaminated with TCE, PVC, EDC, VCM	25,000 cy	Excavation and removal of contaminated soils and sludges; offsite disposal; capping; GW monitoring and treatment	Recovery wells will operate until concentrations of VCM, EDC, and TCE reach 1ppb, 0.94ppb, and 2.7ppb respectively for 2 consecutive sample analyses	1,904,000	43,000
03	Drake Chemical, PA	05/13/86	2nd O.U.	Soils (surface and subsurface), sludges, GW, buildings and debris contaminated with organics and inorganics	3,900 cy 192,000 gals	Incineration of onsite chemicals; demolition and offsite removal of buildings, tanks, and debris; pump and treat waste water lagoons; metal recycling; analysis and possible disposal of decontamination metal recycling fluid	Specific performance standards or goals not outlined in the ROD	3,143,000	0
03	Industrial Lane, PA	09/29/86	1st O.U.	GW contaminated with VOCs, vinyl chloride	N/A	Alternate water supply	N/A	30,800	0

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
03	Lansdowne Radiation, PA	09/22/86	2nd O.U.	Homes contaminated with radium and other radioactive materials	N/A	Demolition and offsite disposal of two homes; Excavation and offsite disposal of contaminated soils	Soils, 5-15 pCi/g; radon-contaminated materials, 0.03 WL; gamma-contaminated materials, 0.17 rem/yr.	4,000,000 - 4,500,000	"minimal"
03	Leetown Pesticide, WV	03/31/86	1st O.U. (Final Remedy)	Pesticide-contaminated soils and debris	3600 cy (soil)	Excavation, consolidation and anaerobic biodegradation of contaminated soil; Removal and offsite disposal of contaminated debris.	DDT less than 300 ppb for treated soils	1,014,000	10,000 (1st yr) 7,500 (2nd yr)
03	Limestone Road, MD	09/30/86	1st O.U.	Soils, GW, SW and sediment contaminated with VOCs, heavy metals, TCE, PCE and base-neutral compounds	N/A	Site grading & capping; monitoring and data collection	Specific performance standards or goals not outlined in the ROD	1,192,580	To be determined
03	Middletown Road, MD	03/17/86	1st O.U. (Final Remedy)	No threat	N/A	No Action	N/A	0	0
03	Millcreek Dump, PA	05/07/86	1st O.U. (Final Remedy)	Soils, sediments and GW contaminated with VOCs, PCBs, inorganics, heavy metals, PAHs and phthalates	N/A	Excavation and onsite consolidation of soils under a RCRA cap; GW pump & treat	PCBs, 10 ppm; PAHs, 2940 ppb; TCE, 10 ppb; phenols, 9 ppm; toluene, 1783 ppb	12,000,000 - 18,000,000	1,763,000 (present worth)
03	Taylor Borough, PA	03/17/86	2nd O.U. (Final Remedy)	Possible GW contamination by VOCs and metals	N/A	Semiannual GW monitoring; No action.	N/A	0	16,000

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
03	Tybouts Corner Landfill, DE	03/06/86	1st O.U. (Final Remedy)	Soils & GW contaminated with TCE, benzene, VOCs and inorganics	N/A	Excavation of waste and soils with onsite consolidation and capping, GW pump & treat	For GW; 100 ppb TVO; 10^{-4} cancer risk for carcinogens	FS estimate $35,000,000 PRP estimate $15,000,000	4,600,000 (present worth)
03	Westline Site, PA	07/03/86	1st O.U. (Final Remedy)	Soils contaminated with tars containing phenols and PAHs	710 cy	Excavation and offsite incineration of tar deposits	Soils will be excavated to a 10^{-4} cancer risk level for contaminants present onsite.	744,000	0
04	A.L. Taylor, KY	06/18/86	1st O.U. (Final Remedy)	Soils and SW contaminated with VOCs, PCBs heavy metals, PAHs, chlorinated aromatics and phthalates	N/A	Excavation of soils, sediments and sludge with onsite containment and capping	Specific performance standards or goals not outlined in the ROD	795,349	Not available
04	Coleman Evans, FL	09/25/86	1st O.U. (Final Remedy)	Soils, sediments, SW, and GW contaminated with VOCs, PCP, organics, heavy metals, chromium and toluene	9,000 cy	Excavation and onsite incineration of soils; onsite backfilling with decontaminated soils; GW recovery and treatment; storage and analysis of recovered GW; onsite carbon adsorption; GW treatment	Excavation of all soils containing PCP in excess of 10mg/kg; GW will be treated to levels which comply with Drinking Water Standards or Water Quality Criteria	3,000,000-3,800,000	0
04	Distler Brickyard, KY	08/19/86	1st O.U. (Final Remedy)	Soils and GW contaminated with VOCs, TCE, toluene, heavy metals and inorganics	8,000 cy	Excavation and offsite disposal of contaminated soils; GW pump & treat	Excavation of all soils to background levels; treatment of GW to background levels	7,500,000 (present worth)	1,569,360 for years 1 & 2; 45,360 for years 3-30
04	Distler Farm, KY	08/19/86	1st O.U. (Final Remedy)	Soils and GW contaminated with VOCs, PCE, TCE, toluene, inorganics and metals	Not available	Excavation and offsite disposal of all contaminated soil; GW pump and offsite treatment at POTW	Soils will be excavated to background levels, and GW will be treated to background levels	11,138,400	113,600 (years 1-10)

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
04	Gallaway Ponds, TN	09/26/86	1st O.U. (Final Remedy)	Pond sediments contaminated with pesticides, inorganics, toxaphene, and chlordane	1,600 cy	Excavation of sediments, onsite disposal, RCRA Subtitle C closure	Specific performance standards or goals not outlined in the ROD	344,735	163,265 (30-year present worth)
04	Hipps Road Landfill, FL	09/03/86	1st O.U. (Final Remedy)	GW contaminated with VOCs, TCE, metals and BTX fractions	N/A	GW pump and treatment at POTW; RCRA Subtitle D landfill closure; relocation of residents	GW will be treated to meet SDWA requirements or 10^{-6} cancer risk	3,900,000 4,400,000	Not specified
04	Hollingsworth, FL	04/10/86	1st O.U. (Final Remedy)	Soils and GW contaminated with TCE, DCE, vinyl chloride and heavy metals	Not available	Excavation, aeration and onsite replacement of contaminated soils; GW pump and treat	Soil criteria: TVO, 1ppm; lead, 0.5 mg/l; nickel, 1 mg/l; copper, 10 mg/l GW criteria: TCE, 3.2 ug/l; vinyl chloride, 1 ug/l; DCE, 70 ug/l	653,730	364,215 (for 2-year operation)
04	Lees Lane Landfill, KY	09/25/86	2nd O.U. (Final Remedy)	Soil, SW, and GW contaminated with VOCs, heavy metals, inorganics	212,400 tons	Removal of exposed drums and offsite disposal; capping; gas collection and venting system; possible alternate water supply; GW monitoring; bank stabilization; institutional controls	Specific performance standards not outlined in ROD; ACL will be developed from GW monitoring data	2,343,000	127,440
04	Mowbray Engineering, AL	09/25/86	1st O.U. (Final Remedy)	Swamp soils contaminated with PCBs	4,800 cy (for a cleanup level of 20 ppm)	Excavation of PCB-contaminated soils with either onsite incineration, offsite incineration; or solidification/stabilization of the waste	Soils with 25 ppm PCBs or greater will be excavated and treated	Onsite incin. 1.1-1.8M Offsite incin. 1.2-2.0M Solid/Stab. 750,000	O&M costs included in estimated remedy costs

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
04	Pepper's Steel, FL	03/12/86	1st O.U. (Final Remedy)	Soils, sediments and GW contaminated with PCBs, organics and heavy metals	PCB>1ppm, approx. 48,000 cy; lead>1000 ppm, 21,500 cy; arsenic> 5 ppm, 9,000 cy (waste qtys. not additive)	Excavation, solidification/ stabilization, and onsite disposal of soils Collection and offsite disposal of free oil	Excavation of soils exceeding 1 ppm PCB, 1000 ppm lead, and 5 ppm arsenic	5,212,000	42,500
04	Pioneer Sand, FL	09/26/86	1st O.U. (Final Remedy)	Soil & pond waters contaminated with sludges, heavy metals, VOCs, and inorganics	N/A	RCRA Subtitle D landfill closure; leachate collection treatment, and onsite disposal; SW treatment and onsite discharge; cover system for sludge pond waste	Specific performance standards or goals not outlined in the ROD	462,025	44,900 for 1st year; 34,900 for subsequent years
04	Sapp Battery, FL	09/26/86	1st O.U. (Final Remedy)	Soils, GW, SW and sediments contaminated with heavy metals	94,000 cy (soil) 20,000 cy (sediment)	Excavation, solidification and onsite disposal of contaminated soils and sediments; GW pump & treat; SW treatment indicator	Cleanup criteria for indicator chemicals were set based on Federal and State standards and risk-based levels	14,318,544	25,631
04	SCRDI/Dixiana, SC	09/26/86	1st O.U. (Final Remedy)	GW contaminated with VOCs, PAHs, PCBs, PCE, inorganics and pesticides	N/A	GW pump & treat, discharge to SW	GW will be treated to attain ACL equivalent to 10^{-6} excess cancer risk	751,250	2,128,100 (30-year period)
05	A&F Materials, IL	08/14/86	2nd O.U. (Final Remedy)	GW contaminated with VOCs, inorganics, TCE, and metals	N/A	GW monitoring; installation of additional monitoring wells; institutional controls	N/A	PRP will pay for remedy costs	PRP will pay for O&M costs

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
05	Arcanum Iron & Metal, OH	09/26/86	1st O.U. (Final Remedy)	Soils, GW, SW, and sediments contaminated with lead, antimony and arsenic	Onsite soils with >500ppm lead, 20,000cy; battery casing chips, 3,800 cy; offsite soils not specified	Excavation and offsite disposal of all soils with >500 ppm lead; Excavation and onsite disposal of all soils with lead between background and 500 ppm	Offsite disposal of soils with lead >500ppm. Onsite disposal of soils with lead between background and 500 ppm. Excavation of offsite soils will be conducted until background levels are reached.	9,929,000	37,000
05	Arrowhead Refinery, MN	09/30/86	1st O.U. (Final Remedy)	GW, soils and sediment contaminated with VOCs, PAHs, and lead	4,600 cy (sludge) 20,500 cy (soils & sediments)	Excavation and onsite incineration of contaminated soils, sediments, and sludge; GW pump and treat; alternate water supply	Soils and sediments will be excavated and treated to achieve a 10^{-6} excess cancer risk level; GW treatment will remove 98 percent of VOCs	22,000,000	130,000- 180,000
05	Burlington Northern, MN	06/04/86	1st O.U. (Final Remedy)	Soils and small areas of GW contaminated with creosote wastes including PAHs, phenols and heterocycles	9,500 cy	Excavation and onsite aerobic breakdown and transformation of contaminated soils and sludges, capping	Possible goals are to achieve detoxification of soils as defined by the microtox test; and achieve total PAH and benzene extractable concentrations in the treatment zone equal to or less than concentrations present in soils left in place	582,000	36,000
05	Burrows Sanitation Site, MI	09/30/86	1st O.U. (Final Remedy)	SW, sediments, GW and soils contaminated with heavy metals and cyanide	250 cy	Excavation, solidification/ fixation and offsite disposal of metal hydroxide sludges; GW pump and treat	GW cleanup based on current lowest regulated concentration for each indicator chemical; soil cleanup based on endangerment assessment	1,256,700- 1,335,400	115,000

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
05	Byron Johnson Salvage Yard, IL	09/23/86	2nd O.U.	GW contaminated with heavy metals, TCE, cyanide and VOCs	N/A	Provision for alternate water supply via home carbon treatment units and bottled water	Remedy will comply with the 10^{-6} cancer risk levels for the suspected carcinogens	115,500	626,800 (5-year present worth)
05	Fields Brook, OH	09/30/86	1st O.U.	Brook sediments contaminated with VOCs, heavy metals, TCE, PCE, PCBs, and base-neutral compounds	36,000 cy	Excavation, solidification and onsite disposal of contaminated sediments	Sediments will be excavated to a 10^{-6} excess cancer risk or to 50 ppm PCBs or less	35,100,000	72,000
					16,000 cy	Excavation, thermal treatment, onsite residual disposal of contaminated sediments			
05	Forest Waste, MI	06/30/86	2nd O.U.	Soils and sediments contaminated with organics and heavy metals	4,000 cy	Excavation, solidification and offsite disposal of soils and sludges	Cleanup levels will achieve an appropriate ingestion rate of 0.1g/day of soil for a 70kg adult	1,295,000	0
					110,000 gal	Removal, solidification and offsite disposal of aqueous lagoon wastes			
05	Lake Sandy Jo, IN	09/26/86	1st O.U. (Final Remedy)	Soils, SW and sediments contaminated with PAHs, base-neutral compounds and heavy metals	2,500 cy	Excavation and onsite consolidation of contaminated sediments, soil capping; alternate water supply	Sediments with contaminants above the 10^{-6} excess cancer risk level will be excavated and consolidated	4,747,000	63,000
05	LaSalle Electrical, IL	08/29/86	1st O.U.	Offsite soils contaminated with PCBs	25,530 cy	Excavation and onsite incineration of offsite soils	Excavation and incineration of soils with greater than 5 ppm PCBs in the first 12 inches of soil, and greater than 10 ppm in soils at depths below 12 inches	26,400,000 (present worth)	0

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
05	Metamora Landfill, MI	09/30/86	1st O.U.	GW and soil contaminated with VOCs, including PCE and TCE, and heavy metals	18,150 cy	Excavation and offsite incineration of wastes from areas 1 and 4	The FY88 RI/FS will establish soil and ground water cleanup targets	41,500,000 (30-year present worth)	0
05	New Brighton/ Arden Hills/ St. Anthony, MN	06/30/86	4th O.U.	GW contaminated with TCE, PCE and other organics	N/A	Well construction to provide an alternate water supply	Not applicable	600,500	22,820
05	Novaco Industries, MI	06/27/86	1st O.U.	Chromium-contaminated GW	36,000,000 gal	GW pump & treat; discharge to SW	GW treatment will achieve Federal or State drinking water criteria	560,000	419,000 (for 6-year period)
05	Reilly Tar & Chemical, MN	05/30/86	2nd O.U.	Soils and GW contaminated with PAHs and phenols	800,000 cy-1,000,000cy	GW pump and treat; capping and filling of exposed wastes; discharge of hazardous waste to sanitary sewer; GW monitoring	Drinking water criteria for PAHs were developed through State and EPA consultations	Cost estimates not fully developed	Cost estimates not fully developed
05	Seymour, IN	09/30/86	1st O.U.	Soil and GW contaminated with VOCs, organics, heavy metals, toluene, benzene	101,690,000 gals	Extraction and treatment of GW	Water discharge will conform with POTW standards	550,000 (present worth)	O&M costs included in capital cost estimate
05	Spiegelberg Landfill, MI	09/30/86	1st O.U.	Soils, GW contaminated with sludge and paint wastes consisting of VOCs and base-neutral compounds	5,000 cy 10,000 cy	Excavation of waste materials with: offsite incineration of liquid paint sludges; offsite disposal of solid paint sludges	All materials exceeding a 10^{-6} excess cancer risk will be excavated as defined in the ROD	15,771,000 - 18,395,000	0
06	Cecil Lindsey, AR	04/23/86	1st O.U. (Final Remedy)	No significant threat	N/A	No action, with site access restriction and GW monitoring	Not applicable	61,000	10,000

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
06	Geneva Industries, TX	09/18/86	1st O.U. (Final Remedy)	Soils and GW contaminated with VOCs, PAHs, PCBs, TCE and fuel oils	22,500 cy	Excavation and offsite disposal of contaminated soils and drums; GW pump & treat; cap	Excavation of soils to 100 ppm PCBs; treatment of GW contamination below 1 ppb TCE	14,990,000	532,000 (years 1 and 2)
06	Odessa Chromium I, TX	09/08/86	1st O.U.	GW contaminated with chromium and other heavy metals	N/A	Negotiating agreements with Odessa City to extend water supply; construct water distribution system	Not applicable	247,920	14,350
06	Odessa Chromium II, TX	09/08/86	1st O.U.	GW contaminated with chromium	N/A	Extension of municipal water service to affected areas	Not applicable	476,570	51,575
06	Sikes Disposal Pits, TX	09/18/86	1st O.U. (Final Remedy)	GW, soils and SW contaminated with organics, BTX fractions	150,000 cy	Excavation and onsite incineration of sludges and soils; onsite ash disposal	Sludges and soils will be excavated to 10 ppm VOAs	102,217,000	41,000
06	United Creosoting Site, TX	09/30/86	1st O.U.	Soils contaminated with PCP, PAHs and creosote	84,000 cy	Excavation and onsite consolidation of soils; temporary cap; permanent relocation of 6 households	Excavation and disposal of all soils contaminated above 100 ppm PAH	Cost estimate undeveloped	43,000
07	Des Moines TCE, IA	07/21/86	1st O.U.	GW contaminated with TCE, PCE and other organics	N/A	GW pump & treat; discharge to SW	Extraction and treatment will continue until maximum TCE conc. in monitoring wells is 5 ug/l or less for 4 consecutive months	1,196,000	63,000
07	Ellisville, MO	09/29/86	2nd O.U.	Soil contaminated with dioxins, heavy metals, VOCs	Not available	Excavation and onsite interim storage of dioxin contaminated soil; excavation, transport & offsite land disposal of soils containing nondioxin waste	Not available	20,200,000 estimated present worth	O&M costs included in estimated capital costs

127

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
08	Denver Radium/ ROBCO, CO	09/30/86	2nd O.U.	Soil and buildings contaminated with radium	7,000 cy of soil 200 cy of demolished buildings	Excavation and offsite disposal of contaminated soils and debris; or	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	1,417,000	0
						Excavation, stabilization and temporary onsite consolidation of contaminated soils		139,300 (initial cost)	6,000
08	Denver Radium Site Streets, CO	03/24/86	1st O.U.	Asphalt contaminated with radium	38,500 cy	Leave contaminated material in place; institutional controls; routine maintenance	Remedy meets standards for "Remedial Action at Inactive Uranium Processing Sites"	30,000	Costs will vary
08	Libby Ground Water, MT	09/26/86	1st O.U.	Soil and GW contaminated with creosote, organics, and inorganics	N/A	Alternate water supply; institutional controls	N/A	152,000 (includes first year O&M costs) PRP will assume costs	64,000 PRP will assume costs
08	Marshall Landfill, CO	09/26/86	1st O.U. (Final Remedy)	Onsite GW and SW and offsite GW contaminated with VOCs, organics, heavy metals, TCE, PCE and benzene	N/A	Fencing, regrading, and revegetation of site; construction of perimeter ditches to collect contaminated GW; air stripping; GW and SW monitoring	Contaminated water will be treated to achieve removal of: benzene 0; TCEs 0; cadmium 0.6 mg/l; lead 4 mg/l	1,819,000	152,800
08	North Dakota Arsenic Trioxide, ND	09/26/86	1st O.U. (Final Remedy)	GW contaminated with arsenic	N/A	Expansion of rural water system; construction of system and hook-up of homes; treatment system construction; possible institutional controls	Ensure that water supplied for domestic and agricultural purposes attains the MCL for arsenic	2,296,000 (includes 1st year O&M)	650,000 (total cost for years 2-10)
08	Smuggler Mountain, CO	09/26/86	1st O.U.	Soil and GW contaminated with cadmium, lead, heavy metals	410,000 cy	Excavation; onsite disposal; capping; GW monitoring; alternate water supply; possible GW treatment	Excavation and onsite isolation of soils with lead greater than 5000 ppm; GW will be monitored to comply with SDWA Standards	1,816,550	30,900

FY86 RECORD OF DECISION SUMMARY TABLE

REGION	SITE NAME, ST	ROD SIG DATE	OPERABLE UNIT	THREAT/ PROBLEM	ESTIMATED WASTE QUANTITY	MAJOR COMPONENTS OF SELECTED REMEDY	PERFORMANCE STANDARDS/GOALS	ESTIMATED CAPITAL COSTS	ANNUAL O&M COSTS
08	Union Pacific Railroad, WY	09/26/86	1st O.U.	Soil and GW contaminated with PCBs, creosote, organics	Greater than 700,000 cy	Contaminant isolation system consisting of rechanneling the river; treatment of contaminated ground water with a carbon adsorption system; slurry wall; GW monitoring	Specific performance standards or goals not outlined in the ROD	7,000,000	57,000
09	Iron Mountain, CA	10/03/86	1st O.U.	SW runoff from Iron Mountain contaminated with acid mine drainage (AMD) consisting of sulfuric acid and heavy metals. Fish and sediment in local SW are also affected	2.5 acres (to be capped)	Capping of selected cracked and caved ground areas; dam enlargement	Cleanup program will be designed to meet EPA Water Quality Criteria for Protection of Aquatic Life for the "worst case" condition of 1978	72,100,000-85,100,000 (present worth)	O&M costs included in capital cost estimate
10	Queen City Farms, WA	10/24/85	1st O.U.	Soils, sediments and SW contaminated with VOCs, chromium, lead, TCE, PCBs and acids	22,000 cy	Excavation, stabilization and offsite disposal of sludges, sediments and soils; cap placement	Specific performance standards or goals not outlined in the ROD	3,439,000	O&M to be conducted and funded by PRPs
10	Toftdahl Drums, WA	09/30/86	1st O.U. (Final Remedy)	No significant threat	N/A	No action; GW monitoring by the State of WA	N/A	0	0
10	United Chrome, OR	09/12/86	1st O.U. (Final Remedy)	GW and soils contaminated with chromium	350 tons (for offsite disposal)	Excavation and offsite disposal of soils; flushing of soils above shallow GW table; GW pump and treat; discharge to POTW or SW	Treated effluent, 0.02 mg/l chromium; confined aquifer, 0.05 mg/l chromium; unconfined aquifer, 10 mg/l chromium	1,580,000	261,000

SECTION IV

INDEX OF APPROVED REMEDIAL ACTIONS: FY 1982 - 1985

The Index of Approved Remedial Actions provides an overview of the selected remedial actions and subsequent actions or media to be addressed, by future operable units, for all RODs signed between FY82-85. The index is presented by Region, in alphabetical order according to the site name.

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Beacon Heights, CT	1st Remedial Action	9/23/85	. Excavation of Betkoski's Dump and other contaminated soils with consolidation onsite . RCRA capping of consolidated wastes, gas venting and stormwater management . Installation of leachate collection system . Collection of leachate and offsite disposal at a licensed waste water treatment facility, or onsite treatment and discharge to Hockanum Brook . Extension of public water supply to the next municipal supply . Fence entire site . Installation of a more extensive ground water monitoring system	. Ground water		
01	Cannon Engineering/ Plymouth, MA	1st Remedial Action	9/30/85	. Removal and offsite disposal of tanks, associated pipework and foundation to a RCRA approved facility			
01	Charles George, MA	1st Remedial Action	12/29/83	. Extend existing water supply system	. Ground water . Source control		
01	Charles George, MA	2nd Remedial Action	7/11/85	. Full synthetic membrane cap . Surface water diversion and collection system . Vent network with off-gas collection system venting to the atmosphere . Full peripheral leachate collection system	. Ground water . Offsite RI/FS . Wetlands . Source control		
01	Hocomonco Pond, MA	1st Remedial Action	9/30/85	1) Former Lagoon - Site grading - Capping - Relocation of storm drain pipe 2) Kettle Pond Area - Dewatering the pond and lowering area ground water levels - Soil/waste excavation - Dewatering sediments, and onsite landfilling - Monitoring air quality with treatment if necessary	. Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Hocomonco Pond, MA (cont.)			- Treatment with discharge of effluent water - Construction of onsite landfill - Restoration of wetland areas 3) Hocomonco Pond and Discharge Stream - Mechanical dredging and onsite disposal of sediments - Treatment of pond water in system constructed for Kettle Pond area 4) Otis Street - Seal storm drain 5) Isolated Areas - Removal of contaminated materials and onsite disposal			
01	Keefe Environmental, NH	1st Remedial Action	11/15/83	. Removal and offsite disposal of lagoon contents and liner and highly contaminated soil	. Ground water . Surface water		
01	McKin Site, ME	IRM	7/15/83	. Onsite cleaning and salvage of tanks . Offsite disposal of liquids and sludges	. Ground water . Soil		
01	McKin Site, ME	2nd Remedial Action	7/22/85	. Onsite aeration of soils . Offsite disposal of approximately 16 drums . Soil tests in petroleum contaminated areas . Construct a ground water extraction, treatment, and surface water discharge system . Reevaluate ground water performance standards . Offsite ground water and surface water monitoring program . Site removal and closure activities	. No further action		
01	Nyanza Chemical, MA	1st Remedial Action	9/4/85	. Excavation and consolidation of sludge deposits/sediments . Construct RCRA cap over entire Hill area . Upgradient surface and ground water diversion system . Downgradient ground water monitoring system	. Ground water . Sediments . Wetlands		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
01	Picillo Farm, RI	1st Remedial Action	9/30/85	• Onsite disposal of primarily PCB and phenol contaminated soils in a RCRA/TSCA landfill • Site closure activities	• Ground water		
01	Re-Solve, MA	1st Remedial Action	7/1/83	• Excavation and offsite disposal of lagoon contents and highly contaminated soil • Cap entire site with 2' of clay	• Ground water • Offsite contamination		
01	Sylvester, NH	IRM	7/29/82	• Installation of a slurry wall • Impervious cap	• No further action		
		Supplemental	9/22/83	• Ground water extraction and treatment system			
01	Western Sand & Gravel, RI	1st Remedial Action	9/28/84	• Installation of carbon canister filters as a temporary measure • Installation of a permanent alternate water supply	• Source control • Ground water		
02	Bog Creek Farm, NJ	1st Remedial Action	9/30/85	• Remove waste water and sediments from pond and bog, regrade and cover both areas • Treat waste water and discharge to stream • Excavate VOC contaminated soil and incinerate onsite or offsite • Evaluate soil washing, segregation and other technologies to reduce the volume of soils to be incinerated • Cover excavated area with compacted soil cap • Install security fence around site and work areas • Implement monitoring program to assess effectiveness of remedial action	• Soil		
02	Bridgeport, NJ	1st Remedial Action	12/31/84	• Disposal of oily waste and sediment/sludge via onsite incineration • Removal and disposal of contaminated water by onsite treatment • Drum excavation and removal offsite • Maintenance pumping of the ground water • Removal and offsite disposal of tanks and waste • Installation of a water supply pipeline	• Ground water • Lagoon closure		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Burnt Fly Bog, NJ	1st Remedial Action	11/16/83	. Excavation and offsite disposal of liquids, sludges, asphalt piles, drums, contaminated soil from lagoons and northern wetlands . Restore site's original contours and vegetation . Monitor ground water for five years	. Further study of the western wetlands		
02	Chemical Control, NJ	1st Remedial Action	9/19/83	. Removal of gas cylinders . Reconstruction of storm sewer catch basins and grates . Cleaning of the storm sewer system and construction of curbing . Decontamination of box trailer and vacuum truck	. Ground water . Soil . Source control		
02	D'Imperio Property, NJ	1st Remedial Action	3/27/85	. Excavation and offsite disposal of contaminated waste, soil and surface drums . Construction of a RCRA cap . Pump and treat ground water	. No further action		
02	Friedman Property, NJ	1st Remedial Action	4/30/85	. No action . Monitoring onsite wells for five years . Deed restrictions	. No further action		
02	GEMS Landfill, NJ	1st Remedial Action	9/27/85	. Construction of cap, regrading of existing landfill slopes . Construction of active gas collection and treatment system . Construction of ground water pumping and treatment system, treatment and discharge of ground water to POTW or surface waters . Remediation of Holly Run and Briar Lake . Construction of surface water controls . Implementation of monitoring program . Construction of fence . Extend existing water supply system			
02	Goose Farm, NJ	1st Remedial Action	9/27/85	. Flush contaminated soil and ground water underlying site, treat ground water and reinject into soil . Conduct testing program to determine the need to cap the site	. Soil		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Goose Farm, NJ (cont.)			. Conduct testing program to determine extent of PCB contamination in drum pit area, determine need for soil remediation			
02	Helen Kramer, NJ	1st Remedial Action	9/27/85	. Construct ground water/leachate collection trench . Install clay cap and slurry wall . Construct active gas collection and treatment system . Dewater, excavate and fill leachate ponds and lagoons . Fence site and work areas . Implement surface water controls to ensure proper construction, implementation and reliability of remedial components . Implement monitoring program to assess effectiveness of remedial action . Collection and treatment of ground water/leachate from trench, disposal to POTW or surface waters	. No further action		
02	Hudson River, NY	1st Remedial Action	9/25/84	. In-place containment of remnant shoreline deposits . Evaluation of Waterford water treatment facility	. Further evaluation of cleanup technologies for contaminated river sediments		
02	Krysowaty Farm, NJ	1st Remedial Action	6/20/84	. Excavation and offsite disposal of contaminated soil and waste . Provision for a permanent alternate water supply . Monitoring onsite wells for five years	. No further action		
02	Lipari Landfill, NJ	1st Remedial Action	8/3/82	. Installation of slurry wall . Cap . Installation of ground water collection wells . Treatment of ground water within slurry wall at the local POTW	. Surface water . Ground water		
02	Lipari Landfill, NJ	2nd Remedial Action	9/30/85	. Install ground water/leachate extraction and injection wells within containment system to flush and dewater system			

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Lipari Landfill, NJ (cont.)			• Pump and treat ground water/leachate within the containment system and discharge to POTW, surface waters, or approved hazardous waste facility • Install and monitor ground water wells downgradient of the site • Flush containment system to cleanse encapsulated material of water-borne contaminants			
02	Lone Pine Landfill, NJ	1st Remedial Action	9/28/84	• Installation of a slurry wall • Installation of a multi-layer surface seal • Installation of ground water collection wells • Treatment of ground water by a POTW or onsite plant	• Completion of field investigation on the extent of offsite ground water contamination		
02	Love Canal, NY	1st Remedial Action	5/6/85	• Hydraulically clean designated sewers • Remove and dewater contaminated sediments from creeks • Inspect sewer reaches for defects and repair damaged flood gate • Dredge and clean culverts • Construct a berm at the area near the 102nd Street outfall • Interim onsite storage of sediments • Install an administration building	• Further evaluation of permanent remedial alternatives		
02	Olean Wellfield, NY	1st Remedial Action	9/24/85	• Reactivate municipal wells, construct two air-stripping systems, treat ground water, discharge to public water supply system • Extend existing Olean water lines to 93 private well users • Inspect McGraw-Edison industrial sewer and analyze repair and replacement options • Recommend institutional controls restricting ground water use • Initiate source control RI/FS	• Source control		
02	PAS Oswego, NY	1st Remedial Action	6/6/84	• Limited excavation and offsite removal of contaminated soil, subsurface tanks, and drums	• Offsite wetlands study		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	PAS Oswego, NY (cont.)			• Construction of a perimeter slurry wall • RCRA Part 264 cap and site grading • Ground water monitoring • Ground water and leachate recovery and treatment			
02	Pijak Farm, NJ	1st Remedial Action	9/30/84	• Removal and offsite disposal of drums and lab packs • Excavation and offsite disposal of visibly contaminated soil • Pumping and removal of contaminated ground water during excavation • Monitoring onsite wells for five years • Additional soil and stream sampling	• Additional soil and/or sediment excavation • Ground water • Source control		
02	Price Landfill, NJ	1st Remedial Action	9/20/83	• Replacement and relocation of the water supply well field and transmission facilities • Analysis of plume management, source control, and ground water treatment remedies	• Plume management • Source control • Ground water		
02	Sinclair Refinery, NY	1st Remedial Action	9/30/85	• Removal and offsite disposal of 300 drums found on the surface of the Central Elevated Landfill Area (CELA) • Excavation and onsite consolidation in the CELA of waste from the South Landfill area • Fence entire site • Fill the South Landfill with clean fill • Cap the consolidated waste in the CELA using a RCRA approved cap • Partial Genesee River channelization to prevent erosion and flooding	• Refinery portion of the site		
02	Spence Farm, NJ	1st Remedial Action	9/30/84	• Excavation and offsite disposal of all drums, lab packs and visibly contaminated soil • Monitoring onsite wells for five years • Site grading and surface restoration • Additional soil and stream sampling	• Additional soil and/or sediment excavation • Ground water • Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
02	Swope Oil, NJ	1st Remedial Action	9/27/85	. Removal and offsite disposal of tanks and building debris . Offsite incineration, treatment or disposal of tank contents . Installation of cap . Excavation and offsite disposal of sludge waste area . Excavation and offsite disposal of PCB contaminated soil	. Ground water . Soil		
02	Wide Beach, NY	1st Remedial Action	9/30/85	. Excavation and chemical treatment of PCB contaminated soil . Offsite disposal of contaminated asphaltic material . Use of treated soils as clean fill in excavated areas . Repave roadways and driveways . Treat perched water in sewer trench . Construct hydraulic barrier at end of sewer trench . Conduct pilot plant treatability study to determine effective PCB treatment scheme . Sample for PCBs in soil, sewage and sediments			
03	Bruin Lagoon, PA	1st Remedial Action	6/2/82	. Removal and offsite disposal of liquid lagoon contents . Physical stabilization of lagoons . Effluent pond cleanup . Dike stabilization . Cap . Construction of a ground water diversion channel	. No further action		
03	Douglassville, PA	1st Remedial Action	9/27/85	. Removal and consolidation of contaminated soils and sediments from the drainage ditch, drainage swale, buried lagoon and drum disposal areas and onsite disposal under cap . Cap former sludge lagoon area and sludge disposal area . Install levees and dikes to protect site from 100-year flood event . Conduct predesign study of soils to determine extent of excavation and capping	. Further study of contaminated ground water to assess need for future remedial action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Drake Chemical, PA	1st Remedial Action	9/30/84	. Cap and grade leachate stream . Partial excavation and temporary onsite storage of contaminated sediments . Construction of conduit and granular drains	. Ground water . Surface water . Source control		
03	Enterprise Avenue, PA	1st Remedial Action	5/10/84	. Offsite disposal of soils which fail key indicator parameter test levels . Backfilling of site with soils which passed parameter test . Grade and vegetate site as a final cover	. No further action		
03	Fischer & Porter, PA	1st Remedial Action	5/4/84	. Improvements in manufacturing facility to prevent release . Onsite installation of pumping wells and packed column aeration to reduce contaminant levels in effluents . Discharge of treated effluent into surface water . Treatment of contaminated wells	. No further action		
03	Harvey-Knott, DE	1st Remedial Action	9/30/85	. Collect & treat surface water & dispose offsite . Removal and offsite disposal of sediments, sludges, bulk wastes, drums, and debris . Install ground water extraction and treatment system, treat ground water and apply to soils to flush out contaminants . Prepare site surface for flushing by: grading area, covering with 2' of clean soil, establishing vegetation	. Wetlands . Surface water		
03	Heleva Landfill, PA	1st Remedial Action	3/22/85	. Installation of an alternate water supply by extending an existing water main . Construction of a RCRA cap . Construction of surface water diversion and gas venting systems . Conduct a predesign study to fully delineate the source of contamination and determine sink-hole activity . Construction of an onsite treatment facility . Pump and treat ground water (source control) . Monitor and sample existing wells and surface water	. No further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Lackawanna Refuse Site, PA	1st Remedial Action	3/22/85	. Excavation and offsite disposal of drums and highly contaminated fill . Construct a leachate collection system . Installation of surface water drainage diversion . Clay capping and construction of gas venting systems . Reconstruction of access road . Development of monitoring program	. No further action		
03	Lansdowne Radiation, PA	1st Remedial Action	8/2/85	. Permanent relocation of residents	. Demolition and removal of a house		
03	Lehigh Electric, PA	1st Remedial Action	2/11/83	. Excavation and removal of contaminated soil, transformers and debris . Offsite disposal of soil . Demolition of onsite buildings . Backfilling, grading and vegetation of site to minimize erosion and control runoff	. No further action		
03	McAdoo, PA	IRM	6/5/84	. Clean and remove underground waste storage tanks . Excavation and offsite disposal of visibly contaminated soil . Evaluate analytical results of soil analyses	. Ground water		
03	McAdoo Associates, PA	2nd Remedial Action	6/28/85	. Removal and offsite disposal of the onsite tank, debris and contaminated soil . Limited excavation of soils . Construction of a RCRA cap . Diversion of surface water . Maintenance of surface water diversion ditches and cover . Conduct a comprehensive mining study to determine appropriate cap design . Evaluate the dilution factor during the design phase	. Ground water . Sediments		
03	Matthews Electroplating, VA	1st Remedial Action	6/2/83	. Provide municipal water service by extension of existing system	. No further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Moyer Landfill, PA	1st Remedial Action	9/30/85	. Install soil cover . Erosion and sedimentation control measures . Surface water diversion . Leachate collection, treatment and discharge . Methane gas recovery and sale . Security/fencing measures . Ground water monitoring . Closure at conclusion of gas generation phase	. If PRP negotiations and/or the methane gas alternative fail, the following will be done: - Grade site, install rip-rap, flatten steep slopes - Gas venting and monitoring - Surface water collection and discharge to Skippack Creek - Leachate collection and treatment to meet 10^{-6} risk level in ground water - Ground and surface water monitoring, cap maintenance, leachate treatment		
03	Sand, Gravel & Stone, MD	1st Remedial Action (Phase I)	9/30/85	. Excavation and offsite disposal of hazardous materials . Ground water extraction and treatment with discharge to ponds, aquifer, or Mill Creek.	. Soil . Ground water		
03	Taylor Borough, PA	1st Remedial Action	6/28/85	. Removal and offsite disposal of drums and remnants . Collection and treatment of contaminated surface water . Excavation and offsite disposal of contaminated soils, wastes, and sediments from two of the former drum storage areas (Drum Storage Areas 1&2) . Backfilling and placement of a 24-inch soil cover over the remaining three former drum storage areas . Installation of a chain link fence around the perimeter of the soil covered areas	. Further study of contaminated ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
03	Tyson's Dump, PA	1st Remedial Action	12/21/84	. Excavation and offsite disposal of contaminated soils and wastes . Upgrade the existing air-stripping facility to treat leachate, shallow ground water, and surface run-on . Excavation and offsite disposal of contaminated sediments within the tributary which receives effluent from the existing air-stripping facility	. Ground water . Offsite contamination		
03	Wade, PA	1st Remedial Action	8/30/84	. Removal and offsite disposal of contaminated soil, tires, tankers, waste piles and underground storage tanks . Demolish buildings, level debris, fill and grade property . Cover site with top soil and seed cap	. No further action		
04	American Cresote, FL	1st Remedial Action	9/30/85	. Excavation and consolidation of contaminated soils from areas both on and off the site in an onsite RCRA landfill	. Ground water		
04	Biscayne Aquifer Sites, FL	1st Remedial Action	9/16/85	. Add air-stripping to existing water treating system . Operate Miami Spring & Preston municipal wells	. Closure of NW 58th St. Landfill (to be addressed by EDD in FY86)		
04	Davie Landfill, FL	1st Remedial Action	9/30/85	. Dewater and stabilize sludge lagoon contents & place in single lined cell . Install cap on cell	. Ground water		
04	Miami Drum Services, FL	1st Remedial Action	9/13/82	. Excavation and offsite disposal of soil . Treatment of ground water encountered during excavation	. Ground water		
04	Varsol Spill Site, FL	1st Remedial Action	3/29/85	. No action	. Ground water		
04	Whitehouse Waste Oil Pits, FL	1st Remedial Action	5/30/85	. Construction of a slurry wall around the entire site . Treatment of contaminated ground water . Excavation and disposal of contaminated sediments under cap . Surface cap the entire site (RCRA 264)	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	A&F Materials-Greenup, IL	IRM	11/23/83	. Removal and offsite disposal of contaminated tank liquids and drum wastes . Temporarily cap lagoons . Conduct RI/FS	. Ground water . Soil		
05	A&F Materials Company, IL	EDD	6/14/85	. Removal and offsite disposal of all soils contaminated over the recommended action levels . Ground water monitoring . Cleaning and removal of onsite equipment and buildings . Testing of soil underlying the building, with disposal if contaminated above the recommended action levels . Site grading . Removal of the fence surrounding the site	. No further action		
05	Acme Solvents, IL	1st Remedial Action	9/27/85	. Provision for interim alternate water supply system by installation of home carbon treatment units . Excavation and offsite disposal of non-incinerable wastes; incineration of other waste materials and soils	. Ground water . Final remedial action to restore drinking water		
05	Berlin & Farro, MI	1st Remedial Action	2/29/84	. Excavation of contaminated landfill, drum and soil areas . Separate PCB and non-PCB wastes & dispose offsite . Incinerate liquid wastes and landfill solid wastes offsite . Backfill or cap site . Conduct RI/FS of soil and ground water contamination	. Ground water . Surface water . Soil		
05	Byron/Johnson Salvage, IL	1st Remedial Action	3/13/85	. Excavation and offsite disposal of all drums and highly contaminated soils . In-situ treatment of all soil with cyanide over 1 ppm	. Residual soils . Ground water		
05	Cemetery Dump, MI	1st Remedial Action	9/11/85	. Excavation and offsite disposal of 250 drums containing PCBs, oils, solvents and paint sludges at a RCRA Subtitle C facility	. Ground water . Soil		
05	Charlevoix, MI	IRM	6/12/84	. Provision for a permanent alternate water supply	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Charlevoix, MI	2nd Remedial Action	9/30/85	• Allow contaminant plumes to discharge to Lake Michigan under natural flow conditions • Continue long-term monitoring of plumes • Institutional controls on installation of private wells	• No further action		
05	Chem-Dyne, OH	EDD	7/5/85	• Installation of a ground water extraction system with subsequent treatment of the contaminated water • Demolition of onsite buildings • Removal of selected soil • Construction of a RCRA cap	• No further action		
05	Cross Brothers, IL	IRM	3/25/85	• Excavation and offsite disposal of surficial and buried waste materials and visibly contaminated soil	• Residual soils • Ground water		
05	Eau Claire, WI	IRM	6/10/85	• Construction of air-stripping facilities to remove VOCs from the contaminated ground water and discharge to municipal water treatment plant and distribution system	• Ground water • Source control		
05	Forest Waste, MI	IRM	2/29/84	• Fence construction	• Source control • Offsite contamination		
05	Kummer Landfill, MN	1st Remedial Action	6/12/85	• Provisions for an alternate water supply	• Source control • Ground water		
05	Laskin Poplar Oil, OH	1st Remedial Action	8/9/84	• Incineration of contaminated waste oil • Treatment of contaminated waste water	• Source control • Ground water		
05	LeHillier/Mankato, MN	1st Remedial Action	9/27/85	• Pump and treat ground water by air-stripping for a ten-year period or until acceptable levels are met • Extend LeHillier water supply system to affected areas • Abandonment of contaminated wells	• Source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Main Street, IN	1st Remedial Action	8/2/85	. Construction of air-stripping facilities to remove VOCs from the contaminated ground water, discharged into water treatment system and drinking water distribution system	. Complete RI/FS on ground water		
05	Morris Arsenic, MN	1st Remedial Action	8/7/85	. No action	. No further action		
05	New Brighton, MN (Interim Water Treatment)	IRM	6/24/83	. Interim treatment of municipal wells by granular activated carbon and air-stripping	. Ground water		
05	New Brighton, MN (Water Supply System)	IRM	9/19/83	. Extend existing public water supply system to affected private well users	. Ground water		
05	New Brighton, MN (Water Supply System)	IRM	8/2/84	. Extend existing public water supply system to replace contaminated municipal system	. Ground water		
05	New Lyme L/F, OH	1st Remedial Action	9/27/85	. Install cap over landfill . Install and operate extraction/containment wells to dewater landfill and eliminate leachate . Onsite treatment of ground water and leachate using biological disc, sodium hydroxide precipitation and granular activated carbon . Onsite consolidation of contaminated sediment . Gas control, fence, monitor ground water	. No further action		
05	Northernaire, MI	1st Remedial Action	9/11/85	. Excavation and offsite disposal of soils and sewer line to privately-owned RCRA Subtitle C facility . Clean building floor of dust and hazardous residue . Break-up 300 sq. ft. of floor and drywell, sample soil, excavate and dispose of any contaminated debris & soil at a RCRA Subtitle C facility . Backfill area with clean soil	. Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Old Mill, OH	1st Remedial Action	8/7/85	. Removal and offsite disposal of 95 percent of contaminants in soil . Ground water extraction and treatment using granular activated carbon . Impose aquifer use restrictions . Provisions for public water supply to those residences potentially affected by contaminated ground water	. No further action		
05	Outboard Marine Corp., IL	1st Remedial Action	5/15/84	. Excavation and offsite disposal of PCB contaminated materials . Construct onsite containment cell for moderately contaminated PCB material . Divert ground water around containment cell . Construct clay-lined dewatering lagoon . Treat supernatant and return to harbor . Cap	. No further action		
05	Reilly Tar, MN	1st Remedial Action	6/6/84	. Construction of a granular activated carbon water treatment system	. Ground water . Soil . Peat bog		
05	Schmalz Dump, WI	1st Remedial Action	8/13/85	. Excavation and offsite disposal of contaminated building debris	. Conduct RI/FS		
05	Verona Well Field, MI	IRM	5/1/84	. Provide new water capacity by drilling new wells . Implement barrier system . Treat purge water by air-stripping system . Treat air emissions by activated carbon adsorption system . Continue RI/FS	. Ground water		
05	Verona Well Field, MI	2nd Remedial Action	8/12/85	. Treat contaminated soils by enhanced volatilization . Contain ground water contaminant plume by pumping and treating at existing air-stripper	. Continue RI . Source control at other known sources		
05	Wauconda Sand & Gravel, IL	1st Remedial Action	9/30/85	. Install leachate collection drains . Provide for leachate disposal at Wauconda sewage treatment plant or at an offsite hazardous waste treatment facility	. Future RI/FS to address ground water, source control		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
05	Wauconda Sand, IL (cont'd)			. Regrade settled, depressed and eroded areas with clean soil cover . Revegetate bare and eroded areas . Construct fence around site			
06	Bayou Bonfouca, LA	1st Remedial Action	8/15/85	. Offsite disposal of creosote waste	. Ground water . Bayou		
06	Bio-Ecology Systems, TX	1st Remedial Action	6/6/84	. Construction of onsite disposal cell with synthetic liner, leachate collection system, and final cover . Stabilize waste and place in onsite cell . Raise elevation of site above 100-year flood plain . Construct fence and warning signs . Install ground water monitoring system	. No further action		
06	Crystal Chemical,[2,3] TX	NOD	9/17/85				
06	Highlands Acid Pit, TX	1st Remedial Action	6/25/84	. Excavation and offsite disposal of waste material . Backfill and seed site . Construct fence and warning signs . Install ground water monitoring system	. ACL study ongoing to determine if any ground water action is required		
06	MOTCO, TX	1st Remedial Action	3/15/85	. Offsite biological treatment of contaminated pit water . Offsite incineration of organic liquids . Offsite disposal of sludges/tars and soils	. Ground water . Soil		
06	Old Inger, LA	1st Remedial Action	9/25/84	. Onsite land treatment of heavily contaminated soils and sludges . Onsite containment and capping of slightly contaminated soils . Close and seal ungrouted onsite well . Pump and treat shallow ground water aquifer . Treat and discharge offsite all contaminated fluids	. Ground water . Wood		

147

[2] - Enforcement Confidential
[3] - Remedy selection not finalized

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
06	South Valley, NM	IRM	3/22/85	. Installation of a new water supply well	. Source control . Ground water		
06	Tar Creek, OK	1st Remedial Action	6/6/84	. Diversion and diking at two major inflow areas . Plug 66 wells . Install ground water monitoring system	. No further action		
06	Triangle Chemical, TX	1st Remedial Action	6/11/85	. Incineration and deep well injection of the tank and drum contents . Decontamination of all onsite structures . Offsite disposal of trash and debris . Mechanical aeration of contaminated soils	. No further action		
07	Aidex, IA	IRM	8/24/83	. Offsite disposal of bulk liquids and semi-solids by deep well injection . Onsite drainage control	. Ground water . Soil		
07	Aidex, IA	2nd Remedial Action	9/30/84	. Excavation and offsite disposal of buried wastes and contaminated soil . Backfilling, grading and seeding of the site . Expansion of the monitoring well network and biannual ground water testing . Vacuuming and washing interior surfaces, floors and walls of the building onsite	. Ground water		
07	Ellisville, MO	1st Remedial Action	7/10/85	1) Callahan Property - Stabilize and control erosion of the fill area - Remove and dispose the plastic cover over the fill area and the cover's hold-down blocks - Remove and salvage the barbed-wire and chain link fences around the site - Remove the gravel in the two drum storage areas 2) Rosalie Property - Excavation and offsite disposal of contaminated soil, drums, cans, and other debris - Soil testing and analysis	. Callahan and Rosalie properties will receive no further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
07	Times Beach, MO (Interim Storage Facility)	1st Remedial Action	1/13/84	. Construct onsite interim storage facility . Transport highly contaminated soil from other sites for storage in facility . Restoration of other sites by excavation and temporary relocation of affected residents	. Permanent soil disposal		
08	Milltown, MT Supplemental ROD		4/14/84 8/7/85	. Abandon existing ground water supply . Replacement and relocation of water supply and transmission facilities . On-going sampling of residential water systems	. Sediments		
08	Woodbury Chemical, CO	1st Remedial Action	7/19/85	. Offsite disposal of pesticide contaminated soil . Offsite incineration of rubble	. No further action		
09	Celtor Chemical Works, CA	IRM	10/4/83	. Offsite transport and disposal of tailing piles and contaminated soil . Conduct RI/FS	. Soil . Ground water . Surface water		
09	Celtor Chemical, CA	2nd Remedial Action	9/30/85	. Excavation & offsite disposal of contaminated soils	. No further action		
09	Del Norte, CA	1st Remedial Action	9/30/85	. Excavation & removal of soil . Extraction & treatment of contaminated ground water . Disposal of spent carbon filters . Disposal of chromium-rich waste brine to RCRA facility . Disposal of treated ground water to POTW . Monitor ground water	. No further action		
09	Jibboom Junkyard, CA	1st Remedial Action	5/9/85	. Excavation and offsite disposal of contaminated soils	. No further action		
09	McColl Site, CA	1st Remedial Action	4/11/84	. Excavation and offsite disposal of wastes and soil	. No further action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
09	Mountain View/ Globe, AZ	1st Remedial Action	6/2/83	. Permanent relocation of residents . Onsite burial of containerized mobile homes . Site closure by capping . Fencing and maintenance	. No further action		
09	San Gabriel/ Area I, CA	IRM	5/11/84	. Installation of packed tower air-stripping systems to treat contaminated ground water . Conduct RI/FS	. Ground water		
09	Stringfellow Acid Pits, CA	IRM	7/22/83	. Fence site, maintain cap, and offsite disposal of leachate	. Source control . Ground water . Soil		
09	Stringfellow Acid Pits, CA	2nd Remedial Action	7/17/84	. Extract and treat ground water and discharge to POTW	. Soil . Source control . Long term RI/FS		
09	Taputimu Farm/Insular Terratories, AS	1st Remedial Action	12/27/83	. Repack chemical/pesticide materials stored onsite . Decontaminate and seal onsite storage facilities . Transport all waste materials to mainland for offsite disposal	. No further action		
10	Ponders Corner, WA	IRM	6/1/84	. Construction of air-stripping towers at wells . Maintenance of system . Conduct RI/FS	. Ground water . Soil		
10	Ponders Corner, WA	2nd Remedial Action	9/30/85	. Continue operation of H1-H2 treatment system . Install variable-frequency controllers on well pump motors to reduce energy requirements . Change fan drives on treatment tower . Install new monitoring wells, upgrade existing wells, continue sampling & analysis of aquifer . Place administrative restrictions on installation and use of wells . Excavation and offsite disposal of septic tanks and drain field piping . Place administrative restrictions on excavation of soils	. Unspecified future remedial action		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
10	South Tacoma Channel Well 12A, WA	IRM	3/18/83	• Pump and treat Well 12A • Air-stripping	• Ground water • Soil		
10	South Tacoma Channel Well 12A, WA	2nd Remedial Action	5/3/85	• Continue to operate IRM • Construction of a ground water treatment system where extraction, treatment and discharge of ground water will occur • Excavation and offsite disposal of contaminated soil • Soil flushing • Maintenance of institutional controls	• No further action		
10	Western Processing, WA	1st Remedial Action	8/5/84	• Onsite and perimeter monitoring of air quality • Removal and offsite disposal/incineration of all bulk liquids, drummed liquids, waste piles and other debris • Removal and proper disposal of all transformers and substation equipment • Demolition and offsite disposal of all onsite buildings • Dismantling of all onsite bulk storage tanks • Control and treat stormwater	• Ground water • Soil		
10	Western Processing, WA	2nd Remedial Action	9/25/85	• Soil sampling and analysis of on and offsite areas • Excavation & offsite disposal of selected soils and non-soil materials, excavate or clean & plug all utility and process lines in Area I • Construct and operate ground water extraction and treatment system • Construct, operate and maintain a stormwater control system • Perform supplemental remedial planning studies if ground water contamination migrates	• Ground water		

INDEX OF APPROVED REMEDIAL ACTIONS
(AS OF 05/23/86)

Region	Site/State	Activity	Date Signed	Remedial Actions	Media to be Addressed or Subsequent Remedial Actions	O&M Requirements	Projected Deletion Date
10	Western Processing, WA (cont'd)			• Excavation and onsite disposal of selected soils; excavation of of utility lines; clean utility manholes and vaults • Install and maintain cap • Perform bench scale tests of soil solidification technique • Excavate Mill Creek sediments			

SECTION V

RECORDS OF DECISION

KEY WORD LIST: FY 1982 - 1986

The ROD Key Word List presents the RODs approved from FY82-86 by major key word categories and subcategories. The key words are a compilation of those identified for each site in the ROD abstracts found at the beginning of this document. The first two pages of this list provide an index of all key words and subcategories. The following text lists those RODs associated with each key word.

SUPERFUND RECORDS OF DECISION
KEY WORD INDEX

Listed below are major key word categories and their sub-categories for Superfund Records of Decision (RODs).

KEY WORDS

(By Category)

Primary Hazardous Substances Detected

Acids
Arsenic
Asbestos
Carcinogenic Compounds
Chromium
Dioxin
Heavy Metals
Inorganics
Mining Wastes
Oils
Organics/VOCs
PAH
PCBs
PCE
Pesticides
Phenols
Radioactive Materials
Sludge
Solvents
Synfuels
TCE
Toluene

Contaminated Media

Air
Ground Water
Sediments (Creek/River/Stream)
Sludge
Soil
Surface Water
Wetlands
Woods

Public Health and Environmental Threats

Direct Contact
Public Exposure

Remedy Selection

Consent Decree
Deed Restriction
Fund Balancing
No Action Remedy
O&M
ROD Addendum
Temporary Remedial Measure

Water Supply

Alternate Water Supply
Drinking Water Contaminants

Site Specific Characteristics

Flood Plain
Seismic
Sole-Source Aquifer
Subsidence

Standard/Regulations Permits/Guidance

Drinking Water Standards
Institutional Controls
Public Health Advisory
RCRA
RCRA Closure Requirements
RCRA Landfill Specifications
RCRA Locational Requirements

Standard/Regulations Permits/Guidance (Continued)

State Criteria
State Permit
TSCA Onsite Disposal Requirements
Water Quality Criteria

Testing/Pilot Studies

Leachability Tests
Treatability Studies

Technology

Aeration
Air Stripping
Capping
Containment
Dredging
Excavation
Filling
Granular Activated Carbon
Ground Water Monitoring
Ground Water Treatment
Incineration
Land Treatment
Leachate Collection/Treatment
Levees
Offsite Disposal
Onsite Containment
Onsite Disposal
Relocation
Plume Managemement
Publicly Owned Treatmen Works (POTW)
Slurry Wall
Solidification
Stabilization

SUPERFUND RECORDS OF DECISION
KEY WORD INDEX

Technology
(Continued)

Surface Water Diversion/ Collection
Treatment Technology
Venting

Miscellaneous

Municipally-Owned Site

Historically Significant

ACL
Background Levels
Deferred Decision

01/27/86

SUPERFUND RECORDS OF DECISION: KEY WORD LIST

Listed below are major key word categories and their sub-categories for Superfund Records of Decision (RODs). Opposite each of these categories is a broad sampling of sites whose ROD contains the listed key word. Some categories may become obsolete or new categories may develop over time due to changes in the focus of the Superfund remedy selection process. The Superfund managers in each Region have copies of all RODs.

KEY WORDS (By Category)	**ASSOCIATED ROD SITES**
Primary Hazardous Substances Detected	**Site, State, (Region)**
Acids	Charles George, MA (I)*; Nyanza Chemical, MA (I); Western Sand & Gravel, RI (I); Chemical Control, NJ (II); PAS Oswego, NY (II); Bruin Lagoon, PA (III); Douglassville, PA (III); Lackawanna Refuse Site, PA (III); A&F Materials-IRM, IL (V); Chem-Dyne-EDD, OH (V); Forest Waste, MI (V)*; Highlands Acid Pit, TX (VI); Tar Creek, OK (VI); Celtor Chemical Works, CA (IX); Iron Mountain Mines, CA (IX); Stringfellow Acid Pits, CA (IX)*, Queen City Farms-IRM/EDD WA (X); Western Processing, WA (X)
Arsenic	Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Chisman Creek, VA (III); Douglassville, PA (III); McAdoo-IRM, PA (III); Moyer Landfill, PA (III); American Creosote, FL (IV); Davie Landfill, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Arcanum Iron & Metal, OH (V); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Morris Arsenic, MN (V); Arsenic Trioxide, ND (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Celtor Chemical, CA (IX)*; McColl, CA (IX); Western Processing, WA (X);
Asbestos	New Lyme, OH (V); Mountain View/Globe, AZ (IX)
Carcinogenic Compounds	Charles George, MA (I); Hocomonco Pond, MA (I); Metaltec/Aerosystems, NJ (II); Taylor Borough, PA (III); Hollingsworth, FL (IV); Reilly Tar, MN (V); Queen City Farms-IRM/EDD, WA (X);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

01/27/86

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Chromium	Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); D'Imperio Property, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Sinclair Refinery, NY (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Douglassville, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); Davie Landfill, FL (IV); Pepper's Steel-EDD, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Burrows Sanitation, MI (V); Northernaire, MI (V); Novaco Industries, MI (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Del Norte, CA (IX); Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X)*;
Dioxin	Baird & McGuire, MA (I); Hyde Park-EDD, NY (II); Love Canal, NY (II); Times Beach, MO (VII); Ellisville MO (VII); Ellisville Site Area, MO (VII)*;
Heavy Metals	Auburn Road, NH (I); Baird & McGuire, MA (I); Cannon/Plymouth, MA (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Keefe Environmental, NH (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Bog Creek Farm, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GEMS Landfill, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Marathon Battery, NY (II); Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NJ (II); Syncon Resins, NJ (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Enterprise Avenue, PA (III); Harvey-Knott, DE (III); McAdoo-IRM, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Wade, PA (III); A. L. Taylor, KY (IV); American Creosote, FL (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Miami Drum Svcs, FL (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Arcanum Iron & Metal, OH (V); Burrows Sanitation, MI (V);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Heavy Metals (Continued)	Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Forest Waste, MI (V)*; Lake Sandy Jo, IN (V); Schmalz Dump, WI (V); Seymour, IN (V); Wauconda Sand & Gravel, IL (V); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); Odessa Chromium I, TX (VI); Old Inger, LA (VI); MOTCO, TX (VI); Tar Creek, OK (VI); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Iron Mountain Mine, CA (IX); Jibboom Junkyard, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Queen City Farms-IRM/EDD, WA (X); United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Inorganics	Auburn Road, NH (I); Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Bog Creek Farm, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Love Canal, NY (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); Wade, PA (III); Distler Brickyard, KY (IV); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); A. L. Taylor, KY (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Burrows Sanitation, MI (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Forest Waste, MI (V)*; Lake Sandy Jo, IN (V); Reilly Tar, MN (V); Wauconda Sand & Gravel, IL (V); Cecil Lindsey, AR (VI); MOTCO, TX (VI); Tar Creek, OK (VI); Ellisville, MO (VII); Libby Ground Water, MT (VIII); Iron Mountain Mine, CA (IX)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

01/27/86

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Mining Wastes	Tar Creek, OK (VI); Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Iron Mountain Mine, CA (IX)
Oils	McKin, ME (I)*; Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Enterprise Avenue, PA (III); Coleman Evans, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); A&F Materials-IRM, IL (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Laskin/Poplar Oil, OH (V); New Lyme, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Geneva Industries, TX (VI); Old Inger, LA (VI); Ellisville, MO (VII); Union Pacific, WY (VIII); Western Processing, WA (X)
Organics/VOCs	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Charles George, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental, NH (I); Kellogg-Deering Well Field, CT (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Sylvester, NH (I); Re-Solve, MA (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Florence Landfill,NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Metaltec/Aerosystems, NJ (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Organics/VOCs (continued)	Industrial Lane, PA (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); McAdoo-IRM, PA (III); Millcreek, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); A. L. Taylor, KY (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Cemetery Dump, MI (V); Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Kummer Landfill, MN (V); Main St. Wellfield, IN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Old Mill OH (V); Reilly Tar & Chemical-EDD, MN (V); Seymour, IN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); South Valley-IRM, NM (VI); Triangle Chemical, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Des Moines TCE, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Del Norte, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X); Western Processing, WA (X)*
PAH (Polynuclear Aromatic Hydrocarbons)	Baird & McGuire, MA (I); Cannon/Plymouth, MA (I); Caldwell Trucking, NJ (II); Douglassville, PA (III); Millcreek, PA (III); Taylor Borough, PA (III); Westline Site, PA, (III); American Creosote, FL (IV); SCRDI Dixiana, SC (IV); A. L. Taylor, KY (IV); Whitehouse Waste Oil Pits, FL (IV);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
PAH (Polynuclear Aromatic Hydrocarbons) (continued)	Arrowhead Refinery, MN (V); Lake Sandy Jo, IN (V); Laskin/Poplar Oil, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN(V); Geneva Industries, TX (VI); United Creosoting, TX (VI); Libby Ground Water, MT (VIII); Western Processing, WA (X)*
PCBs (Polychlorinated Biphenyls)	Picillo Farm, RI (I); Tinkham Garage, NH (I); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Goose Farm, NJ (II); Hyde Park-EDD, NY (II); Hudson River, NY (II); Krysowaty Farm, NJ (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); Douglassville, PA (III); Harvey-Knott, DE (III); Lehigh Electric, PA (III); Millcreek, PA (III); Mowbray Engineering, AL (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Berlin & Farro, MI (V); Byron/Johnson Salvage Yard, IL (V); Chem-Dyne-EDD, OH (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); MOTCO, TX (VI); Jibboom Junkyard, CA (IX); Taputimu Farm, AS (IX); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*
PCE (Tetrachloroethylene/ Perchloroethylene)	Keefe Environmental, NH (I); Picillo Farm, RI (I); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); Metaltec/Aerosystems, NJ (II); Rockaway Borough Wellfield, NJ (II); Fischer & Porter, PA (III); SCRDI Dixiana, SC (IV); A. L. Taylor, KY (IV); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Main St. Wellfield, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Geneva Industries, TX (VI); Marshall Landfill, CO (VIII); San Gabriel/ Area I, CA (IX); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Pesticides	Baird & McGuire, MA (I); Cannon/Plymouth MA (I); Chemical Control, NJ (II); Krysowaty Farm, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Pijak Farm, NJ (II); Syncon Resins, NJ (II); Douglassville, PA (III); Drake Chemical, PA (III); Leetown Pesticide, WV (III); Gallaway Ponds, TN (IV); Miami Drum Svcs, FL (IV); SCRDI Dixiana, SC (IV); Chem-Dyne-EDD, OH (V); Old Inger, LA (VI); Aidex-IRM, IA (VII); Ellisville, MO (VII); Woodbury Chemical, CO (VIII); Del Norte, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Western Processing, WA (X)
Phenols	Hocomonco Pond, MA (I); Picillo Farm, RI (I); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Pijak Farm, NJ (II); Sinclair Refinery, NY (II); Douglassville, PA (III); Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Westline, PA (III); Coleman Evans, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Laskin/Poplar Oil, OH (V); Reilly Tar & Chemical-EDD, MN (V); Geneva Industries, TX (VI); Sikes Disposal Pits, TX (VI); Ellisville, MO (VII); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*
Radioactive Materials	Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; Moyer Landfill, PA (III); Denver Radium/ROBCO, CO (VIII); Denver Radium Site Streets, CO (VIII)
Sludge	Tinkham Garage, NH (I); Bridgeport, NJ (II); Florence Landfill, NJ (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Swope Oil, NJ (II); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); McAdoo Associates, PA (III)*; Davie Landfill, FL (IV); Pioneer Sand, FL (IV); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Laskin/Poplar Oil, OH, (V); New Lyme, OH (V); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); Des Moines TCE, IA (VII); Ellisville, MO (VII); McColl, CA (IX)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
Solvents	Keefe Environmental, NH (I); McKin, ME (I)*; Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); Kentucky Avenue Wellfield, NY (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); Spence Farm, NJ (II); Vestal, NY (II); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Miami Drum Svcs, FL (IV); A&F Materials-IRM, IL (V); Berlin & Farro, MI (V); Charlevoix, MI (V); Cross Bros., IL (V); New Brighton-Interim Water Treatment, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Old Mill, OH (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Old Inger, LA (VI); Ellisville, MO (VII); Taputimu Farm, AS (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); Western Processing, WA (X)
Synfuels	Western Processing, WA (X)
TCE (Trichloroethylene)	Auburn Road, NH (I); Charles George, MA (I); Keefe Environmental, NH (I); Kellogg-Deering Well Field, CT (I); McKin-IRM, ME (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Lang Property, NJ (II); Metaltec/Aerosystems, NJ (II); Olean Well Field, NY (II); Price Landfill, NJ (II)*; Rockaway Borough Wellfield, NJ (II); Sharkey Landfill, NJ (II); Vestal, NY (II); Blosenski Landfill, PA (III); Fischer & Porter, PA (III); Heleva Landfill, PA (III); Industrial Lane, PA (III); Limestone Road, MD (III); Millcreek, PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III); Distler Brickyard, KY (IV); Hollingsworth, FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; LeHillier/Mankato, MN (V); Main St. Wellfield, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton-Water Supply System,

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Primary Hazardous Substances Detected (continued)	**Site, State, (Region)**
TCE (Trichloroethylene) (continued)	MN (V); Seymour, IN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); Des Moines TCE, IA (VII); Marshall Landfill, CO (VII); San Gabriel/Area I, CA (IX); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)
Toluene	Charles George, MA (I); Industri-plex, MA (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Love Canal, NY (II); Sinclair Refinery, NY (II); Blosenski Landfill, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Moyer Landfill, PA (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); American Creosote, FL (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); A. L. Taylor, KY (IV); New Lyme, OH (V); Seymour, IN (V); Verona Well Field, MI (V)*; Sikes Disposal Pits, TX (VI); Triangle Chem., TX (VI); Ellisville, MO (VII); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*

Contaminated Media

Air	McKin-IRM, ME (I); Sylvester, NH (I); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Love Canal, NY (II); Heleva Landfill, PA (III); Lansdowne Radiation, PA (III)*; Taylor Borough, PA (III); Wade, PA (III); Berlin & Farro, MI (V); Chem-Dyne-EDD, OH (V); Outboard Marine, IL (V); Verona Well Field-IRM, MI (V); Mountain View/Globe, AZ (IX); Taputimu Farm, AS (IX); South Tacoma, WA (X)
Ground Water	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Charles George, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kellogg-Deering Well Field, CT (I); McKin-IRM, ME (I);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	**Site, State, (Region)**
Ground Water (continued)	Nyanza Chemical, MA (I); Picillo Farm, RI (I); Re-Solve, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); Friedman Property, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Metaltec/Aerosystems, NJ (II); Olean Well Field, NY (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Rockaway Borough Wellfield, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III); Fischer & Porter, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Industrial Lane, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III); Westline, PA (III); American Creosote, FL (IV); Biscayne Aquifer Sites, FL (IV); Coleman Evans, FL (IV); Davie Landfill, FL (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Miami Drum Services, FL (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Varsol Spill Site, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Charlevoix, MI (V)*; Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Forest Waste, MI (V)*; Lake Sandy Jo, IN (V); LeHillier/Mankato, MN (V); Main St.

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	**Site, State, (Region)**
Ground Water (continued)	Wellfield, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton-Interim Water Treatment, MN (V); New Brighton/St. Anthony-IRM, MN (V); New Brighton-Water Supply System, MN (V); New Lyme, OH (V); Northernaire, MI (V); Novaco Industries, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN (V); Seymour, IN (V); Verona Well Field-IRM, MI (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); South Valley-IRM, NM (VI); Tar Creek, OK (VI); United Creosoting, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Des Moines TCE, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Milltown-S, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Celtor Chemical Works, CA (IX); Del Norte, CA (IX); McColl, CA (IX); San Gabriel/Area I, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Sediments (Creek/River/ Stream)	Auburn Road, NH (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Tinkham Garage, NH (I); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Hudson River, NY (II); Love Canal, NY (II); Pijak Farm, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Harvey-Knott, DE (III); Leetown Pesticide, WV (III); Limestone Road, MD (III); Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Tyson's Dump, PA (III); Westline, PA (III); American Creosote, FL (IV); Coleman Evans, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Fields Brook, OH (V); Forest Waste, MI (V)*; Lake Sandy Jo, IN (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Wauconda Sand &

---

* Second Record of Decision

S Supplemental Record of Decision

EDD Enforcement Decision Document

Contaminated Media **(continued)**	**Site, State, (Region)**
Sediments (Creek/River/ Stream) (continued)	Gravel, IL (V); Bayou Bonfouca, LA (VI); Cecil Lindsey, AR (VI);Geneva Industries, TX (VI); Sikes Disposal Pits, TX (VI); Milltown, MT (VIII); Woodbury Chemical (VIII); Iron Mountain Mine, CA (IX); Queen City Farms-IRM/EDD, WA (X); Western Processing, WA (X)*
Sludge	Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Bridgeport, NJ (II); Swope Oil, NJ (II); American Creosote, FL (IV); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Bio-Ecology Systems, TX (VI); Highlands Acid Pit, TX (VI); Old Inger, LA (VI); Queen City Farms-IRM/EDD, WA (X)
Soil	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Re-Solve, MA (I); Tinkham Garage, NH (I); Western Sand & Gravel, RI (I); Bog Creek Farm, NJ (II); Brewster Well Field, NY (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Chemical Control, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Lipari Landfill, NJ (II); Lipari Landfill, NJ (II)*; Lone Pine Landfill, NJ (II); Love Canal, NY (II); Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Wide Beach, NY (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Harvey-Knott, DE (III); Enterprise Avenue, PA (III); Lackawanna Refuse Site, PA (III); Lansdowne Radiation, PA, (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Matthews Electroplating, VA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	**Site, State, (Region)**
Soil (continued)	Westline, PA (III); American Creosote, FL (IV); Coleman Evans, FL (IV); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); Miami Drum Services, FL (IV); Mowbray Engineering, AL (IV); Pepper's Steel-EDD, FL (IV); Pioneeer Sand, FL (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Distler Brickyard, KY (V); Forest Waste-IRM, MI (V); Forest Waste, MI (V)*; Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Main St. Wellfield, IN (V); Morris Arsenic, MN (V); New Lyme, OH (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN (V); Schmalz Dump, WI (V); Seymour, IN (V); Verona Well Field, MI (V)*; Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); Triangle Chem., TX (VI); United Creosoting, TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Des Moines TCE, IA (VII); Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Times Beach, MO (VII); Denver Radium/ROBCO, CO (VIII); Libby Ground Water, MT (VIII); Milltown, MT (VIII); Milltown-S, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Mountain View/Globe, AZ (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Taputimu Farm, AS (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Surface Water	Auburn Road, NH (I); Beacon Heights, CT (I); Cannon/Plymouth, MA (I); Hocomonco Pond, MA (I); McKin-IRM, ME (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Tinkham Garage, NH (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Contaminated Media (continued)	Site, State, (Region)
Surface Water (continued)	(II); Hudson River, NY (II); Krysowaty Farm, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); Love Canal, NY (II); Marathon Battery, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Army Creek Landfill, DE (III); Bruin Lagoon, PA (III); Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Fischer & Porter PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Westline, PA (III); Gallaway Ponds, TN (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Chem-Dyne-EDD, OH (V); Laskin/Poplar Oil, OH (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN (V); Wauconda Sand & Gravel, IL (V); Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); Tar Creek, OK (VI); Libby Ground Water, MT (VIII); Marshall Landfill, CO (VIII); Smuggler Mountain, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Iron Mountain Mine, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*
Wetlands	Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Tinkham Garage, NH (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Combe Fill South Landfill, NJ (II); Helen Kramer, NJ (II); PAS Oswego, NY (II); Wide Beach, NY (II); Chisman Creek, VA (III); Harvey-Knott, DE (III); Millcreek, PA (III); Westline, PA (III); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Reilly Tar & Chemical-EDD, MN (V); Schmalz Dump, WI (V); Old Inger, LA (VI); Tar Creek, OK (VI)
Woods	Tinkham Garage, NH (I); Lansdowne Radiation, PA (III); Old Inger, LA (VI)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Public Health and Environmental Threats	**Site, State, (Region)**
Direct Contact	Industri-plex, MA (I); Winthrop Landfill-EDD, ME (I); Hudson River, NY (II); Love Canal, NY (II); Pijak Farm, NJ (II); Spence Farm, NJ (II); Forest Waste-IRM, MI (V)
Public Exposure	Burnt Fly Bog, NJ (II); Love Canal, NY (II); Metaltec/Aerosystems, NJ (II); Lansdowne Radiation, PA (III); Millcreek, PA (III); Verona Well Field-IRM, MI (V); McColl, CA (IX)
Remedy Selection	
Consent Decree	Winthrop Landfill-EDD, ME (I); Hyde Park-EDD, NY (II); Fischer & Porter, PA (III); A&F Materials Company-EDD, IL (V); Chem-Dyne-EDD, OH (V); Reilly Tar & Chemical-EDD, MN (V)
Deed Restriction	Winthrop Landfill-EDD, ME (I); Friedman Property, NJ (II); Chisman Creek, VA (III); Arcanum Iron & Metal, OH (V); Lake Sandy Jo, IN (V); Morris Arsenic, MN (V); Reilly Tar & Chemical-EDD, MN (V); South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Fund Balancing	Outboard Marine Corp., IL (V); Iron Mountain Mine, CA (IX)
No Action Remedy	Friedman Property, NJ (II); Middletown Road, MD (III); Taylor Borough, PA (III)*; Varsol Spill, FL (IV); Morris Arsenic, MN (V); Cecil Lindsey, AR (VI); Toftdahl Drum, WA (X)*
O & M	Auburn Road, NH (I); Baird & McGuire, MA (I); Industri-plex, MA (I); Kellogg-Deering Well Field, CT (I); Re-Solve, MA (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Brewster Well Field, NY (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, KY (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Love Canal, NY (II); Marathon Battery, NY (II); Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II); Price Landfill, NJ (II)*; Rockaway Borough Wellfield, NJ (II); Sharkey Landfill, NJ (II); Spence Farm, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Army Creek Landfill, DE (III);

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Remedy Selection (continued)	**Site, State, (Region)**
O & M (continued)	Blosenski Landfill, PA (III); Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Drake Chemical, PA (III); Heleva Landfill, PA (III); Lansdowne Radiation, PA (III)*; Limestone Road, MD (III); Matthews Electroplating, VA (III); Millcreek, PA (III); Tybouts Corner Landfill, DE (III); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Pioneer Sand, FL (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); A.L. Taylor, KY (IV); Whitehouse Waste Oil Pits, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Chem-Dyne-EDD, OH (V); Eau Claire-IRM, WI (V); Lake Sandy Jo, IN (V); Old Mill, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN (V); Seymour, IN (V); Verona Well Field-IRM, MI (V); Bio-Ecology Systems, TX (VI); Geneva Industries, TX (VI); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); Tar Creek, OK (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Des Moines TCE, IA (VII); Ellisville Site Area, MO (VII)*; Arsenic Trioxide, ND (VIII); Denver Radium/ROBCO, CO (VIII); Libby Ground Water, MT (VIII); Milltown, MT (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Iron Mountain Mine, CA (IX); San Gabriel/Area I, CA (IX); Stringfellow Acid Pits, CA (IX)*; Ponders Corner-IRM, WA (X); South Tacoma Channel-Well 12A, WA (X)*; Toftdahl Drum, WA (X); United Chrome, OR (X); Western Processing, WA (X)*
ROD Addendum	Sylvester, NH (I); Milltown, MT (VIII)
Temporary Remedial Measure	Hudson River, NY (II); Byron Salvage Yard, IL (VI)*; Denver Radium/ROBCO, CO (VIII); Union Pacific, WY (VIII)
Water Supply	
Alternate Water Supply	Auburn Road, NH (I); Charles George, MA (I); Winthrop Landfill-EDD, ME (I); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); Krysowaty Farm, NJ (II); Bridgeport, NJ (II); Caldwell Trucking, NJ (II); Kentucky Avenue

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Water Supply (continued)	**Site, State, (Region)**
Alternate Water Supply (continued)	Wellfield, NY (II); Metaltec/Aerosystems, NJ (II); Olean Well ield, NY (II); Price Landfill, NJ (II); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Fischer & Porter, PA (III); Industrial Lane, PA (III); Matthews Electroplating, VA (III); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Byron Salvage Yard, IL (V)*; Charlevoix, MI (V); Eau Claire-IRM, WI (V); Kummer Landfill, MN (V); Lake Sandy Jo, IN (V); New Brighton/Arden Hills/St. Anthony, MN (V); New Brighton-Water Supply System, MN (V); Old Mill, OH (V); Reilly Tar, MN (V); Verona Well Field-IRM, MI (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); South Valley-IRM, NM (VI); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Milltown, MT (VIII); Smuggler Mountain, CO (VIII)
Drinking Water Contaminants	Auburn Road, NH (I); Kellogg-Deering Well Field, CT (I); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Combe Fill South Landfill, NJ (II); Kentucky Avenue Wellfield, NY (II); Metaltec/Aerosystems, NJ (II); Rockaway Borough Wellfield, NJ (II); Vestal, NY (II); Blosenski Landfill, PA (III); Chisman Creek, VA (III); Fischer & Porter, PA (III); Industrial Lane, PA (III); Hipps Road Landfill, FL (IV); Arrowhead Refinery, MN (V); Byron Johnson Salvage Yard, IL (V)*; Eau Claire-IRM, WI (V); Lake Sandy Jo, IN (V); Main St. Wellfield, IN (V); Reilly Tar & Chemical-EDD, MN (V); Verona Well Field-IRM, MI (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); South Valley-IRM, NM (VI); Des Moines TCE, IA (VII); Arsenic Trioxide, ND (VIII); Libby Ground Water, MT (VIII); Smuggler Mountain, CO (VIII)
Site Specific Characteristics	
Flood Plain	Baird & McGuire, MA (I); Tinkham Garage, NH (I); Florence Landfill, NJ (II); Helen Kramer, NJ (II); Sharkey Landfill, NJ (II); Bruin Lagoon, PA (III)*; Drake Chemical, PA (III); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); A&F Materials-EDD, IL (V); A&F Materials-IRM, IL (V); Bayou Bonfouca, LA (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Sikes Disposal Pits, TX (VI); Triangle Chemical, TX (VI); Celtor Chemical, CA (IX)*
Seismic	McColl, CA (IX)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Site Specific Characteristics (continued)	**Site, State, (Region)**
Sole-Source Aquifer	Price Landfill, NJ (II); Rockaway Borough Wellfield, NJ (II); Biscayne Aquifer Sites, FL (IV); Pioneer Sand, FL (IV)
Subsidence	McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Wauconda Sand & Gravel, IL (V); Highlands Acid Pit, TX (VI)
Standards/Regulations/Permits/Guidance	
Drinking Water Standards	Rockaway Borough Wellfield, NJ (II); Coleman Evans, FL (IV); Old Inger, LA (VI); Burrows Sanitation, MI (VI); South Valley-IRM, NM (VI); Milltown, MT (VIII); United Chrome, OR (X)
Institutional Controls	Beacon Heights, CT (I); Winthrop Landfill-EDD, ME (I); Friedman Property, NJ (II); Marathon Battery, NY (II); Olean Well Field, NY (II); Chisman Creek, VA (III); Industrial Lane, PA (III); Tybouts Corner, DE (III); Biscayne Aquifer Sites, FL (IV); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Charlevoix, MI (V)*; Lake Sandy Jo, IN (V); Old Mill, OH (V); Reilly Tar & Chemical-EDD, MN (V); Odessa Chromium I, TX (VI); Odessa Chromium II, TX (VI); Old Inger, LA (VI); United Creosoting, TX (VI); Arsenic Trioxide, ND (VIII); Denver Radium Site Streets, CO (VIII); Libby Ground Water, MT (VIII); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; Western Processing, WA (X)*
Public Health Advisory	Lansdowne Radiation, PA (III)
RCRA	Western Sand & Gravel, RI (I); Love Canal, NY (II); PAS Oswego, NY (II); Biscayne Aquifer Sites, FL (IV); Arcanum Iron & Metal, OH (V); Burrows Sanitation, MI (V); Old Mill, OH (V); Aidex, IA (VII)*; Ellisville Site Area, MO (VII)*; Ponders Corner, WA (X)*
RCRA Closure Requirements	Winthrop Landfill-EDD, ME (I); Bridgeport, NJ (II); Combe Fill North Landfill, NJ (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Enterprise Avenue, PA (III); Moyer Landfill, PA (III); Tyson's Dump, PA (III); Gallaway Ponds, TN (IV); Pioneer Sand, FL (IV); Lake Sandy Jo, IN (V); South Tacoma, WA (X); Western Processing, WA (X)*

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Standards/Regulations/ Permits/Guidance (continued)	**Site, State, (Region)**
RCRA Landfill Specifications	Picillo Farm, RI (I); Caldwell Trucking, NJ (II); Lang Property, NJ (II); Sharkey Landfill, NJ (II); Drake Chemical, PA (III); Tyson's Dump, PA (III); American Creosote, FL (IV); Pioneer Sand, FL (IV); Spiegelberg Landfill, MI (V); Bio-Ecology Systems, TX (VI); Western Processing, WA (X)*
RCRA Locational Requirements	Tyson's Dump, PA (III); Berlin & Farro, MI (V)
State Criteria	Brewster Well Field, NY (II); Bridgeport, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Kentucky Avenue Wellfield, NY (II); Metaltec/Aerosystems, NJ (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Coleman Evans, FL (IV); Hipps Road Landfill, FL (IV); SCRDI Dixiana, SC (IV); A&F Materials-EDD, IL (V); Reilly Tar & Chemical-EDD, MN (V); Ellisville Site Area, MO (VII)*; Union Pacific, WY (VIII); Iron Mountain Mine, CA (IX); South Tacoma, WA (X)
State Permit	D'Imperio Property, NJ (II); Goose Farm, NJ (II); Army Creek Landfill, DE (III); Verona Well Field-IRM, MI (V)
TSCA Onsite Disposal Requirements	Picillo Farm, RI (I); Krysowaty Farm, NJ (II); Mowbray Engineering, AL (IV); Fields Brook, OH (V)
Water Quality Criteria	Lipari Landfill, NJ (II)*; Army Creek Landfill, DE (III); Coleman Evans, FL (IV); New Brighton-Water Supply System, MN (V); Verona Well Field-IRM, MI (V)
Testing/Pilot Studies	
Leachability Tests	Re-Solve, MA (I)
Treatability Studies	Winthrop Landfill-EDD, ME (I); Leetown Pesticide, WV (IV); Arcanum Iron & Metal, OH (V); Old Inger, LA (VI)
Technology	
Aeration	McKin, ME (I); Hollingsworth, FL (IV); Triangle Chem., TX (VI)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, Name, (Region)**
Air Stripping	Industri-plex, MA (I); Kellogg-Deering Well Field, CT (I); Brewster Well Field, NY (II); Caldwell Trucking, NJ (II); Lang Property, NJ (II); Olean Well Field, NY (II); Vestal, NY (II); Price Landfill, NJ (II)*; Tyson's Dump, PA (III); Biscayne Aquifer Sites, FL (IV); Hollingsworth, FL (IV); Eau Claire-IRM, WI (V); LeHillier/Mankato, MN (V); Main St. Wellfield, IN (V); Seymour, IN (V); Verona Well Field-IRM, MA (V); Verona Well Field, MI (V)*; Des Moines TCE, IA (VII); Marshall Landfill, CO (VIII); San Gabriel/Area I, CA (IX); Ponders Corner-IRM, WA (X); Ponders Corner, WA (X)*; South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*
Capping	Beacon Heights, CT (I); Charles George, MA (I)*; Hocomonco Pond, MA (I); Industri-plex, MA (I); Nyanza Chemical, MA (I); Re-Solve, MA (I); Sylvester, NH (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II); Combe Fill North Landfill, NJ (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); Florence Landfill, NJ (II); GEMS Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); PAS Oswego, NY (II); Sharkey Landfill, NJ (II); Sinclair Refinery, NY (II); Swope Oil, NJ (II); Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Douglassville, PA (III); Drake Chemical, PA (III); Enterprise Avenue, PA (III); Heleva Landfill, PA (III); Lackawanna Refuse Site, PA (III); Limestone Road, MD (III); Matthews Electroplating, VA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Moyer Landfill, PA (III); Tybouts Corner, DE (III); Tyson's Dump, PA (III); Wade, PA (III); Davie Landfill, FL (IV); Hipps Road Landfill, FL (IV); A.L. Taylor, KY (IV); Whitehouse Waste Oil Pits, FL (IV); Chem-Dyne-EDD, OH (V); New Lyme, OH (V); Bio-Ecology Systems Site, TX (VI); Geneva Industries, TX, (VI); Old Inger, LA (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Smuggler Mountain, CO (VIII); Iron Mountain Mine, CA (IX); Mountain View/Globe, AZ (IX); Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); Western Processing, WA (X)*
Containment	Hudson River, NY (II); Lipari Landfill, NJ (II)*; Drake Chemical, PA (III); New Lyme, OH (V); Outboard Marine Corp., IL (V); Times Beach, MO (VII)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, Name, (Region)**
Dredging	Hocomonco Pond, MA (I); Hudson River, NY (II); Love Canal, NY (II); Marathon Battery, NY (II); Outboard Marine Corp., IL (V); Tar Creek, OK (VI)
Excavation	Baird & McGuire, MA (I); Beacon Heights, CT (I); Hocomonco Pond, MA (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Tinkham Garage, NH (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); D'Imperio Property, NJ (II); Helen Kramer, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Love Canal, NY (II); Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); Blosenski Landfill, PA (III); Douglassville, PA (III); Drake Chemical, PA (III); Leetown Pesticide, WV (III); Lansdowne Radiation, PA (III)*; Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Millcreek, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Tyson's Dump, PA (III); Tybouts Corner, DE (III); Westline, PA (III); American Creosote, FL (IV); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Gallaway Ponds, TN (IV); Hollingsworth, FL (IV); Miami Drum Svcs, FL (IV); Mowbray Engineering, AL (IV); Sapp Battery, FL (IV); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Forest Waste, MI (V); Lake Sandy Jo, IN (V); LaSalle Electrical, IL (V); Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Bayou Bonfouca, LA (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Old Inger, LA (VI); Sikes Disposal Pits, TX (VI); United Creosoting, TX (VI); Aidex, IA (VII)*; Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Times Beach, MO (VII); Denver Radium/ROBCO, CO (VIII); Denver Radium Site Streets, CO (VIII); Smuggler Mountain, CO (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte, CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology **(continued)**	**Site, Name, (Region)**
Filling	Lehigh Electric, PA (III); Taylor Borough, PA (III); Wade, PA (III); Coleman Evans, FL (IV); A&F Materials-EDD, IL (V); Tar Creek, OK (VI); Woodbury Chemical, CO (VIII)
Granular Activated Carbon	Rockaway Borough Wellfield, NJ (II); New Brighton-Interim Water Treatment, MN (V); New Lyme, OH (V); Reilly Tar, MN (V); Reilly Tar & Chemical-EDD, MN (V); Old Inger, LA (VI); San Gabriel/Area 1, CA (IX); Stringfellow Acid Pits, CA (IX)*
Ground Water Monitoring	Auburn Road, NH (I); Baird & McGuire, MA (I); Beacon Heights, CT (I); Hocomonco Pond, MA (I); Industri-plex, MA (I); Kellogg-Deering Well Field, CT (I); McKin, ME (I); Nyanza Chemical, MA (I); Picillo Farm, RI (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Burnt Fly Bog, NJ (II); Caldwell Trucking, NJ (II); Friedman Property, NJ (II); Hyde Park-EDD, NY (II); Kentucky Avenue Wellfield, NY (II); Krysowaty Farm, NJ (II); Metaltec/Aerosystems, NJ (II); PAS Oswego, NY (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Army Creek Landfill, DE (III); Blosenski Landfill, PA (III); Bruin Lagoon, PA (III)*; Chisman Creek, VA (III); Drake Chemical, PA (III); Limestone Road, MD (III); Millcreek, PA (III); Moyer Landfill, PA (III); Taylor Borough, PA (III)*; Tybouts Corner, DE (III); Gallaway Ponds, TN (IV); Hipps Road Landfill, FL (IV); Pepper's Steel-EDD, FL (IV); Pioneer Sand, FL (IV); Sapp Battery, FL (IV); A&F Materials-EDD, IL (V); Arcanum Iron & Metal, OH (V); Burrows Sanitation, MI (V); Byron Salvage Yard, IL (V)*; Lake Sandy Jo, IN (V); New Lyme, OH (V); Novaco Industries, MI (V); Reilly Tar & Chemical-EDD, MN (V); Bio-Ecology Systems, TX (VI); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); Sikes Disposal Pits, TX (VI); Aidex, IA (VII)*; Ellisville Site Area, MO (VII)*; Arsenic Trioxide, ND (VIII); Marshall Landfill, CO (VIII); Smuggler Mountain, CO (VIII); Union Pacific, WY (VIII); Woodbury Chemical, CO (VIII); Queen City Farms-IRM/EDD, WA (X); Toftdahl Drum, WA (X)
Ground Water Treatment	Baird & McGuire, MA (I); Industri-plex, MA (I); Kellogg-Deering Well Field, CT (I); McKin, ME (I); Sylvester, NH (I); Sylvester-S, NH (I); Tinkham Garage, NH (I); Winthrop Landfill-EDD, ME (I); Brewster Well Field, NY (II); Combe Fill South Landfill, NJ (II); D'Imperio Property, NJ (II); GEMS

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, Name, (Region)**
Ground Water Treatment (continued)	Landfill, NJ (II); Goose Farm, NJ (II); Helen Kramer, NJ (II); Hyde Park-EDD, NY (II); Lang Property, NJ (II); Lipari Landfill, NJ (II)*; Olean Well Field, NY (II); PAS Oswego, NY (II); Price Landfill, NJ (II)*; Rockaway Borough Wellfield, NJ (II); Sharkey Landfill, NJ (II); Syncon Resins, NJ (II); Vestal, NY (II); Blosenski Landfill, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Leetown Pesticide, WV (III); Millcreek, PA (III); Tybouts Corner, DE (III); Coleman Evans, FL (IV); Distler Brickyard, KY (IV); Hipps Road Landfill, FL (IV); Hollingsworth, FL (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Whitehouse Waste Oil Pits, FL (IV); Arrowhead Refinery, MN (V); Chem-Dyne-EDD, OH (V); LeHillier/Mankato, MN (V); New Lyme, OH (V); Novaco Industries, MI (V); Old Mill, OH (V); Seymour, IN (V); Verona Well Field, MI (V)*; Geneva Industries, TX (VI); Des Moines TCE, IA (VII); Marshall Landfill, CO (VIII); Union Pacific, WY (VIII); Del Norte, CA (IX); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X)*
Incineration	Baird & McGuire, MA (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Hyde Park-EDD, NY (II); Swope Oil, NJ (II); Drake Chemical, PA (III); Lackawanna Refuse Site, PA (III); Westline, PA (III); Coleman Evans, FL (IV); Mowbray Engineering, AL (IV); Acme Solvents, IL (V); Arrowhead Refinery, MN (V); Berlin & Farro, MI (V); Fields Brook, OH (V); LaSalle Electrical, IL (V); Laskin/Poplar Oil, OH (V); Metamora Landfill, MI (V); Spiegelberg Landfill, MI (V); MOTCO, TX (VI); Sikes Disposal Pits, TX (VI); Triangle Chem., TX (VI); Woodbury Chemical, CO (VIII); Western Processing, WA (X)
Land Treatment	Old Inger, LA (VI)
Leachate Collection/ Treatment	Beacon Heights, CT (I); Charles George, MA (I)*; Picillo Farm, RI (I); Combe Fill South Landfill, NJ (II); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Price Landfill, NJ (II)*; Moyer Landfill, PA (III); Pioneer Sand, FL (IV); New Lyme, OH (V); Wauconda Sand & Gravel, IL (V); United Chrome, OR (X)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, Name, (Region)**
Levees	Baird & McGuire, MA (I); Douglassville, PA (III); Old Inger, LA (VI)
Offsite Disposal	Cannon/Plymouth, MA (I); Keefe Environmental, NH (I); McKin-IRM, ME (I); McKin, ME (I)*; Re-Solve, MA (I); Burnt Fly Bog, NJ (II); Chemical Control, NJ (II); D'Imperio Property, NJ (II); Krysowaty Farm, NJ (II); Lang Property, NJ (II); Marathon Battery, NY (II); Metaltec/Aerosystems, NJ (II); Pijak Farm, NJ (II); Price Landfill, NJ (II)*; Spence Farm, NJ (II); Swope Oil, NJ (II); Syncon Resins, NJ (II); Bruin Lagoon, PA (III); Enterprise Avenue, PA (III); Harvey-Knott, DE (III); Lackawanna Refuse Site, PA (III); Lansdowne Radiation, PA (III)*; Leetown Pesticide, WV (III); Lehigh Electric, PA (III); McAdoo-IRM, PA (III); McAdoo Associates, PA (III)*; Sand, Gravel & Stone, MD (III); Taylor Borough, PA, (III); Westline, PA (III); Distler Brickyard, KY (IV); Miami Drum Services, FL (IV); Pepper's Steel-EDD, FL (IV); SCRDI Dixiana, SC (IV); A&F Materials-IRM, IL (V); A&F Materials-EDD, IL (V); Acme Solvents, IL (V); Arcanum Iron & Metal, OH (V); Berlin & Farro, MI (V); Burrows Sanitation, MI (V); Byron/Johnson Salvage Yard, IL (V); Cemetery Dump, MI (V); Chem-Dyne-EDD, OH (V); Cross Bros., IL (V); Forest Waste, MI (V)*; Northernaire, MI (V); Old Mill, OH (V); Outboard Marine Corp., IL (V); Schmalz Dump, WI (V); Wauconda Sand & Gravel, IL (V); Bayou Bonfouca, LA (VI); Cecil Lindsey, AR (VI); Geneva Industries, TX (VI); Highlands Acid Pit, TX (VI); MOTCO, TX (VI); Triangle Chem., TX (VI); Aidex-IRM, IA (VII); Aidex, IA (VII)*; Ellisville, MO (VII); Ellisville Site Area, MO (VII)*; Denver Radium/ROBCO, CO (VIII); Denver Radium Site Streets, CO (VIII); Woodbury Chemical, CO (VIII); Celtor Chemical Works, CA (IX); Celtor Chemical, CA (IX)*; Del Norte CA (IX); Jibboom Junkyard, CA (IX); McColl, CA (IX); Stringfellow Acid Pits-IRM, CA (IX); Ponders Corner, WA (X)*; Queen City Farms-IRM/EDD, WA (X); South Tacoma Channel-Well 12A, WA (X)*; United Chrome, OR (X); Western Processing, WA (X); Western Processing, WA (X)*
Onsite Containment	Re-Solve, MA (I); Enterprise Avenue, PA (III); Millcreek, PA (III); Davie Landfill, FL (IV); Lake Sandy Jo, IN (V); New Lyme, OH (V); Outboard Marine Corp., IL (V); Bio-Ecology Systems, TX (VI); United Creosoting, TX (VI); Ellisville Site Area, MO (VII)*; Times Beach, MO (VII); Denver Radium/ROBCO, CO (VIII); Western Processing, WA (X)*

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	Site, Name, (Region)
Onsite Disposal	Hocomonco Pond, MA (I); Picillo Farm, RI (I); Tinkham Garage, NH (I); Caldwell Trucking, NJ (II); Love Canal, NY (II); Drake Chemical, PA (III); Enterprise Avenue, PA (III); American Creosote, FL (IV); Gallaway Ponds, TN (IV); SCRDI Dixiana, SC (IV); Sapp Battery, FL (IV); Arcanum Iron & Metal, OH (V); LaSalle Electrical, IL (V); Sikes Disposal Pits, TX (VI); Aidex, IA (VII)*; Smuggler Mountain, CO (VIII); Mountain View/Globe, AZ (IX); Western Processing, WA (X)*
Relocation	Lansdowne Radiation, PA (III); Lansdowne Radiation, PA (III)*; United Creosoting, TX (VI); Times Beach, MO (VII); Mountain View/Globe, AZ (IX)
Plume Management	Hyde Park-EDD, NY (II); Price Landfill, NJ (II); Burrows Sanitation, MI (V); Seymour, IN (V); Verona Well Field-IRM, MI (V)
Publicly Owned Treatment Works (POTW)	Tinkham Garage, NH (I); GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II)*; Tybouts Corner, DE (III); Seymour, IN (V); Del Norte, CA (IX); Stringfellow Acid Pits, CA (IX)*; Western Processing, WA (X)*
Slurry Wall	Sylvester, NH (I); Florence Landfill, NJ (II); Helen Kramer, NJ (II); Lipari Landfill, NJ (II); Lone Pine Landfill, NJ (II); PAS Oswego, NY (II); Whitehouse Waste Oil Pits, FL (IV); Geneva Industries, TX (VI); Union Pacific, WY (VIII)
Solidification	Mowbray Engineering, AL (IV); Pepper's Steel, FL (IV); Sapp Battery, FL (IV); Fields Brook, OH (V); Forest Waste, MI (V)*; Burrows Sanitation, MI (V); Queen City Farms, WA (X)
Stabilization	Re-Solve, MA (I); Marathon Battery, NY; Bruin Lagoon, PA (III); Bruin Lagoon, PA (III)*; Pepper's Steel-EDD, FL (IV); Denver Radium/ROBCO, CO (VIII); Queen City Farms-IRM/EDD, WA (X)
Surface Water Diversion/ Collection	Charles George, MA (I)*; McKin, ME (I)*; Nyanza Chemical, MA (I); Blosenski Landfill, PA (III); Harvey-Knott, DE (III); Heleva Landfill, PA (III); Leetown Pesticide, WV (III); Moyer Landfill, PA (III); Taylor Borough, PA (III); Queen City Farms-IRM/EDD, WA (X)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Technology (continued)	**Site, Name, (Region)**
Treatment Technology	Baird & McGuire, MA (I); Tinkham Garage, NH (I); Bog Creek Farm, NJ (II); Bridgeport, NJ (II); Caldwell Trucking, NJ (II); Goose Farm, NJ (II); Marathon Battery, NY (II); Metaltec/Aerosystems, NJ (II); Syncon Resins, NJ (II); Wide Beach, NY (II); Bruin Lagoon, PA (III)*; Leetown Pesticide, WV (III); Coleman Evans, FL (IV); Mowbray Engineering, AL (IV); Pepper's Steel-EDD, FL (IV); Sapp Battery, FL (IV); Arrowhead Refinery, MN (V); Burrows Sanitation, MI (V); Forest Waste, MI (V)*; LaSalle Electrical, IL (V); MOTCO, TX (VI); Sikes Disposal Pits, TX (VI); Triangle Chemical, TX (VI); Stringfellow Acid Pits, CA (IX)*; United Chrome, OR (X); Western Processing, WA (X)*
Venting	Beacon Heights, CT (I); Charles George, MA (I)*; GEMS Landfill, NJ (II); Helen Kramer, NJ (II); Heleva Landfill, PA (III); Moyer Landfill, PA (III); New Lyme, OH (V)
Miscellaneous	
Municipally-Owned Site	Winthrop Landfill-EDD, ME (I); Rockaway Borough Wellfield, NJ (II); Army Creek Landfill, DE (III); Enterprise Avenue, PA (III); Denver Radium Site Streets, CO (VIII)
Historically Significant	**This category represents key words that will not be highlighted after FY 1986.**
ACL	Sylvester, NH (I); Western Sand & Gravel, RI (I); Winthrop Landfill-EDD, ME (I); Bog Creek Farm, NJ (II); D'Imperio Property, NJ (II); Goose Farm, NJ (II); Blosenski Landfill, PA (III); Harvey-Knott, DE (III); SCRDI Dixiana, SC (IV); Highlands Acid Pit, TX (VI); Aidex, IA (VII)*; Old Mill, OH (V); Western Processing, WA (X)*
Background Levels	Nyanza Chemical, MA (I); Industrial Lane, PA (III); Sand, Gravel & Stone, MD (III); Taylor Borough, PA (III); Distler Brickyard, KY (IV); Distler Farm, KY (IV); Reilly Tar, MN (V); Triangle Chemical, TX (VI); Aidex, IA (VII)*; Arsenic Trioxide, ND (VIII); Toftdahl Drum, WA (X)

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document

Historically Significant **(continued)**	**Site, Name, (Region)**
Deferred Decision	Cannon/Plymouth, MA (I); Lipari Landfill, NJ (II)*; Swope Oil, NJ (II); Douglassville, PA (III); McAdoo Associates, PA (III)*; Taylor Borough, PA (III); Tyson's Dump, PA (III); American Cresote, FL (IV); Davie Landfill, FL (IV); New Brighton/Arden Hills/St. Anthony, MN (V); Bayou Bonfouca, LA (VI); Ponders Corner, WA (X)*; South Tacoma Channel-Well 12A, WA (X)*

---

* Second Record of Decision
S Supplemental Record of Decision
EDD Enforcement Decision Document